

TECHNICAL FISHERY REPORT 89-11



**Alaska Department of Fish and Game
Division of Commercial Fisheries
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June 1989

Upper Cook Inlet Salmon Escapement Studies, 1987

by
Bruce E. King
and
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State of Alaska

Steve Cowper, Governor

The Technical Fishery Report Series was established in 1987, replacing the Technical Data Report Series. The scope of this new series has been broadened to include reports that may contain data analysis, although data oriented reports lacking substantial analysis will continue to be included. The new series maintains an emphasis on timely reporting of recently gathered information, and this may sometimes require use of data subject to minor future adjustments. Reports published in this series are generally interim, annual, or iterative rather than final reports summarizing a completed study or project. They are technically oriented and intended for use primarily by fishery professionals and technically oriented fishing industry representatives. Publications in this series have received several editorial reviews and at least one *blind* peer review refereed by the division's editor and have been determined to be consistent with the division's publication policies and standards.

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ABSTRACT

Sockeye salmon (*Oncorhynchus nerka*) escapements into four major river systems of Upper Cook Inlet, Alaska were estimated in 1987 using Bendix Corp. side-scanning sonar equipment. Sockeye salmon escapements totaled 1,596,870 into the Kenai River, 249,246 into the Kasilof River, 118,896 into the Crescent River, and 66,053 into the Yentna River. Escapements of pink salmon (*O. gorbuscha*), chum salmon (*O. keta*), and coho salmon (*O. kisutch*) into the Yentna River were also monitored during the sockeye salmon return. Numbers of these species counted before the project was terminated on 14 August were 684,099 pink, 17,858 chum, and 6,277 coho salmon. Age composition of sockeye salmon was predominantly 1.3 for the Kenai River (78.4%); 1.2 (43.4%), 1.3 (27.4%), and 2.2 (22.4%) for the Kasilof River; 1.2 (23%) and 1.3 (52%) for the Yentna River; and 2.3 (45%) and 1.3 (47.7%) for the Crescent River. Mean weight and length by age class and sex of sockeye salmon are also presented for each river. Analysis of sockeye salmon spatial and temporal distribution indicated that escapements into all rivers were bank oriented, and passage ranged from evenly distributed (Yentna and Kasilof Rivers) to primarily in hours of darkness (Kenai River). Run timing was normal into the Kasilof and Crescent Rivers and late into the Kenai and Yentna Rivers. Escapement information for other Upper Cook Inlet streams compiled by other Alaska Department of Fish and Game divisions, state and federal agencies, and nonprofit corporations are documented.

KEY WORDS: Pacific salmon escapements, hydroacoustic enumeration, biological sampling, migratory behavior, Upper Cook Inlet

INTRODUCTION

Because of the glacial nature of many Upper Cook Inlet rivers (Figure 1), sockeye salmon (*Oncorhynchus nerka*) escapement enumeration within the drainages prior to 1968 was limited to surveys of clearwater spawning areas. These surveys proved inadequate for commercial fishery management because they provided no information about the proportion of the escapement which spawned in glacially occluded waters. Efforts to manage the commercial harvest of sockeye salmon were also hampered by the lack of timely daily and cumulative estimates of total escapement. Sonar technology was eventually recognized as a potential tool for counting sockeye salmon in these glacially occluded waters.

In the early 1960's the Alaska Department of Fish and Game (ADF&G), Division of Commercial Fisheries contracted Bendix Corporation to develop sonar equipment to count sockeye salmon migrating through the lower reaches of selected major spawning rivers of Cook Inlet. Hydroacoustic counters were initially placed in the Kenai River in 1968. Various models were developed and used in succeeding years, eventually resulting in the installation of Bendix Corp. side-scanning sonar counters in the Kenai River in 1976, the Kasilof River in 1978, the Susitna River in 1978 and the Crescent River in 1971. Since the 1986 season, counting in the Susitna River has been limited to the Yentna River (the system's largest known sockeye salmon producing tributary).

Prior to the 1984 field season, Bendix Corp. was again contracted by the ADF&G to develop a side-scanning sonar counter with greater counting range (range resolution). The elimination of the existing 18-m aluminum substrate was also required. The counter was tested at various sonar sites, including the Susitna River (King 1987) and Kenai River (King 1988), prior to use as the primary source of data collection on the north bank of the Kenai River in 1987.

The 1984 counter offered several options which were considered of potential benefit to counting operations. The absence of a substrate appeared to reduce variability in fish behavior and resultant time required to monitor the counting system. In addition, the space requirements of a substrateless counting system were significantly reduced because of the absence of cable mooring systems. This was of particular importance in the Kenai River because adjacent land owners and river users tend to conflict with these underwater obstructions. The ability to change the counting criteria for each sector increased counting flexibility and therefore better represented actual fish behavior.

A description of Upper Cook Inlet (Figure 1), Alaska management area and its major sockeye salmon (*O. nerka*) producing rivers was presented by Tarbox et al. (1983). Historical information on the salmon escapements to these river systems can be found in Waltemyer et al. (1980). Results of escapement enumeration projects since 1979 are documented in Tarbox et al. (1983) and King and Tarbox (1984, 1986, 1987, and 1988).

In 1987 sockeye salmon escapements were monitored daily by ADF&G in the Kenai, Kasilof, Crescent and Yentna River drainages (Figures 2 through 5). Pink salmon (*O. gorbuscha*), chum salmon (*O. keta*), and coho salmon (*O. kisutch*) escapements into the Yentna River were also monitored during the sockeye salmon run.

The primary objectives of UCI escapement projects conducted by the Commercial Fisheries Division on the Kenai River, Kasilof River, Yentna River and Crescent River in 1987 were to estimate

- (1) the magnitude of escapement and migration timing of sockeye salmon in the mainstem river, and
- (2) the age, weight, length (AWL), and sex characteristics of the sockeye salmon escapement.

A secondary objective was to investigate the magnitude, timing, and distribution of sockeye salmon on the spawning grounds of the established tributary index areas of the Kenai and Kasilof River drainages.

Population estimates or counts of salmon in UCI streams made by ADF&G divisions, federal agencies and nonprofit corporations have also been included in this report. In many cases these numbers are not formally reported, and as primary users of escapement information, we felt it necessary to assemble all escapement data in one publication.

METHODS

Sonar systems convert electrical energy into acoustical energy (sound waves) and provide information about underwater targets by measuring the number and strength of the returning echoes. Any object with a density different than that of water, which therefore reflects the sound waves broadcast by the transducer, is a target.

Sonar processors used on this project are designed to select as targets echoes which exceed a signal strength of -38 dB. These signals are further processed by counting the number of successive echoes which return from a given target. When the number of echoes exceeds a pre-set minimum, the target is counted as a fish.

The 1978 (and updated 1981 version) and 1984 model side-scanning sonar counters consisted of an electronic sounder/processor, transducer and 12-V battery/solar panel power source. An oscilloscope was used to monitor and calibrate the system. The transducers were 2° and 4° at -3 decibels (dB). The transducer could be fired on the 2°, 4°, or alternate mode. In the alternate mode the transducer fired one 4° pulse and accepted returning echoes from the inshore half of the counting range, followed by a 2° pulse with returning echoes accepted from the offshore half of the counting range. Pulse width of the transmitted sound wave was 100 μ s and the frequency was 515 kHz and 500 kHz for the 1981 and 1984 models, respectively. The pulse repetition rate and power (level of voltage applied to the transducer) were variable.

The fish hit criteria (minimum number of returning echoes from a target to meet the requirements for designation as a fish) of the 1984 counter was adjustable within each linear sector in contrast to previous models which process returning echoes based on a fixed number of hits within each counting sector. Each sector was one-twelfth (1978 model) or one-sixteenth (1984 model) of the total counting

range. The processor accumulates and prints the counts on tape, in 1-h intervals, for each linear sector.

The precision of both counters was assessed by comparing the ratio of visual counts on the oscilloscope to processor counts. This ratio was then used to adjust the pulse repetition rate of the sounder. The Bendix Corp. side scanning sonar system does not lend itself to correcting raw data since its operation is based on an average passage rate of large numbers of fish. The processor does not provide information necessary to make judgments about individual targets. We made the assumption that the system was calibrated to correctly count the average number of fish passing the counters in periods between calibrations, recognizing that some fish did not count and others counted more than once. We assume that these errors canceled each other. In rivers where we knew that fish swimming speed change rapidly (i.e., Kenai), we increased the frequency of calibrations to the point of calibrating several times per hour during peak passage periods. In essence, we monitored the counts full time during daily period when fish behavior was known to be most variable.

No effort was made to calculate the volume of water sampled with the hydroacoustic equipment or expand counts for areas of the river not sampled. It was assumed that near bottom, near shore behavior exposed all sockeye salmon migrating during the main body of the escapement to the hydroacoustic beam.

Counter printouts were edited prior to analysis and adjustments were made for counts which did not appear to be from fish. Generally, these counts were the result of debris on the substrate (1978 counter), or slight shifts in aiming of the transducer along the bottom (1984 counter). The procedure for adjusting these counts was to substitute an average count for suspect sector counts. The average count was calculated by dividing the total good counts in adjacent sector/hour blocks by the number of blocks.

The 1978 counter was designed for use in conjunction with an 18-m tubular aluminum substrate (Figure 6). The substrate provides an aiming surface; fish migrating upstream had to cross the substrate and enter the ensonified area or go around the substrate. The substrate rested on the stream bottom perpendicular to the channel axis. Aiming was accomplished by manually adjusting knobs which control vertical and horizontal movement of the transducer.

The 1984 model counter was fitted for two transducers which could be used individually or fired alternately for variable time periods. This feature allows users to monitor different portions of the river if desired. A single transducer was used at the Kenai site. It was mounted on a tripod which allowed adjustment in the vertical and horizontal planes.

Additional differences between the counters included a maximum power level for the 1984 model of 240 V as contrasted to the maximum 60 V available for the 1978 model. The 1984 counter also included a "rock inhibitor" function which eliminated counts from stationary targets that returned a target strength greater than -38 dB. The blanking affect had a resolution of 0.4 percent of the total counting range for each stationary target encountered. Fish passing through the inhibited area are not counted, but are visible on the oscilloscope trace.

A more detailed description of the theory of operation of the Bendix Corp. side-scanning sonar counter (pre-1984 models), and description of the electronic

equipment are presented in Gaudet (1983). Procedures for deployment and operation of the 1978 model counter are described in Bendix Corp. (1980). Similar information for the 1984 model is found in Bendix Corp. (1984).

Counting of adult salmon in 1987 began and ended on the following dates:

Kenai River	- 22 June to 15 August
Kasilof River	- 13 June to 7 August
Yentna River	- 29 June to 14 August
Crescent River	- 25 June to 7 August

Migratory behavior of sockeye salmon at the sonar sites was assessed by analysis of distribution from shore (expressed in percentage of targets by counting sector), hourly distribution, bank preference for travel, and cumulative proportion of sonar counts by day (migratory timing).

Fish wheels were installed at all sites except Crescent River to assist in assessing migrational timing of salmon species, estimate species composition of sonar counts, and obtain escapement AWL samples. At Crescent River fish were collected using a 2-m gill net drifted near shore immediately downstream of the sonar substrate. The leading, or downstream portion of the net, was sunk immediately upon contact with a fish, creating a bagging effect to trap fish not gilled or tangled in the mesh. This was done to minimize potential gear selectivity. Fish captured were enumerated by species and sockeye salmon were sampled for age (scale samples), weight, length and sex characteristics.

Fish wheel catches were adjusted for those days when wheels were not fished for a full 24 h. To accomplish this, daily catches were multiplied by the ratio of 24 h to the actual number of hours fished.

To derive species composition of sonar counts, daily adjusted fish wheel catches were grouped into samples of at least 150 salmon, and the species proportions were calculated. The daily sonar count was then multiplied by those proportions to divide the total sonar count into counts by species.

Length (mid-eye to fork-of-tail) and weight data were obtained from all sockeye salmon captured until approximately 600 samples per river were collected. Weight samples were then discontinued and it was assumed that weights by age class and sex did not change significantly for the remainder of the season. These fish were also sampled for age composition and sex characteristics.

Scales taken from the first 300 sockeye adults captured were also used to provide "known" growth pattern samples for the stock identification catch composition program. After the needs of the stock identification program were met and adequate samples were provided for length/weight analysis, the AWL sampling program was then tailored to provide data necessary to determine the age composition of the remainder of the escapement.

In the years 1983-85, studies were undertaken on the Kenai, Kasilof, and Susitna Rivers to determine the degree of change in age composition of the sockeye escapement over time (King and Tarbox 1984, 1986, 1987). The data indicated that the age structure of the Kenai River remained essentially constant, while that of the Kasilof and Yentna Rivers changed as the season progressed. Consequently, the scale sampling program for the Kenai River was limited to one major sampling

period during the peak of the 1987 escapement. The Kasilof and Yentna Rivers sampling program remained unchanged in 1987; each river was sampled over three periods. Age class proportions by period were weighted by escapement size within the period to arrive at a total season age composition. AWL sampling of species other than sockeye was deleted from the program because of budget reductions.

Sample size goals and sample periods were established following the procedures described in Waltemyer (1988). Confidence intervals were calculated for the major age classes at all sites using the following formula adapted from Cochran (1977).

$$CI = +/- V[E_j] * t(\alpha = 0.05, n-1 \text{ df})$$

In this formula $V[E_j]$ is the sum of the variances associated with the estimated number of fish age j which escaped during each stratum. An error in calculating age class confidence intervals for the 1985 and 1986 sockeye salmon escapements (King and Tarbox 1987, 1988) was corrected and reported in this report.

Numbers of fish by age class and sampling period collected at the Kasilof and Yentna River sites were formatted in a contingency table, and a chi-square test was performed on the data sets to determine if the proportions of fish by age class were independent of time of sampling. If the null hypothesis was rejected (indicating a difference in age class frequency by period), then the chi-square test was repeated between sampling periods to determine when changes in age composition occurred.

Sex ratios were calculated by grouping all samples together regardless of timing of sampling. Minimum crew size and time constraints at the Crescent River site precluded collection of adequate numbers of fish to meet these and following age composition sampling goals.

Index-area escapement surveys were conducted by staff personnel on the Kenai River and Kasilof River. A combination of fixed-wing aircraft and foot surveys were conducted from 1 August to 15 September. Index area counts and other survey data documented in this report are a total of live and dead counts, but do not necessarily represent a peak count. If there was more than one survey on a system, the highest total count was reported. Data from additional surveys are stored in Commercial Fisheries Division stream survey files in Soldotna.

Tables listing results of surveys or counts from systems not monitored by Commercial Fisheries Division list a reference to the agency or organization which provided the data. Counts were from aerial surveys, ground surveys, or weirs. Specific methods used to obtain counts are contained in the files of the respective ADF&G divisions and Federal agencies. Cook Inlet Aquaculture Association methods were discussed with representatives of ADF&G as part of the application process for obtaining a scientific collection permit.

RESULTS AND DISCUSSION

Kenai River

From 22 June through 15 August, 1,612,575 fish were enumerated in the Kenai River (Appendix A.1). The estimated sockeye salmon escapement was 1,596,870 fish (Table 1). This level of escapement was approximately twice the upper bound of the desired escapement goal range (400,000-700,000 fish). The estimated number of potential spawners (sonar count minus sport harvest above the Soldotna bridge) was 1,396,295 fish (Table 2).

Individual tributary escapement estimates and sources of data are presented in Tables 3 and 4. The total index area escapement was 234,971 sockeye salmon, the highest on record. With the exception of Hidden Lake, individual tributary escapements were within the range of historical counts. These data indicate that the record escapement was differentially distributed in uncounted areas, however, the total index area escapement was probably also low due to the lack of counts from Tern Lake and the relatively late date of survey of Railroad, Johnson, and Moose Creeks (25 September). In addition, the Quartz Creek count was the result of a single aerial survey.

As in previous years, measured bank orientation of the salmon escapement appeared to change as the season progressed (Appendices A.2 and A.3 and Figures 7 and 8). In the early part of the season (prior to 20 July), fish appeared to be widely distributed from shore on both banks. During the period encompassing greater than 85% of the total sockeye salmon escapement (20 July through 14 August), over 98% (range 96.3 to 99.3%) of the north bank counts and 99% (range 97.5 to 100%) of the south bank counts were recorded within 6 m of the transducer.

Previous work (King 1988) on the north bank of the Kenai River suggested that the presence of the substrate altered fish behavior, and that the fixed hit criteria of the 1981 counter resulted in inaccurate distribution information. Other reasons for the wider distribution of fish from shore in the early part of the season include a higher proportion of chinook salmon in the escapement and their propensity for holding, and thus being overcounted near the offshore end of the substrate and relatively low and slow flow conditions. Slow flow conditions resulted in slower current velocities which allowed normally shore oriented sockeye salmon to range more freely from shore. However, as water levels rose and corresponding current velocities increased, sockeye salmon selected a nearshore route which afforded the least resistance to upstream movement.

Use of the 1984 counter on the north bank in 1987 provided more accurate information regarding distribution of upstream migrating salmon because substrate and counting logic concerns were eliminated or reduced. Because the 1981 counter was used on the south bank in 1987, it is likely that equipment influences on actual or recorded distribution were present and responsible for at least some portion of the perceived offshore distribution.

However the mid-season change in distribution from shore exhibited in previous years, and on the south bank in 1987, was still present. This suggested that in the early part of the season, when the total number of targets was relatively low, that chinook salmon may have had a proportionally greater influence on

distribution data. However, as the main part of the sockeye salmon return began to pass the counters, the proportion of offshore moving or holding fish was reduced to nearly zero.

Hourly distribution of fish was concentrated between 1300 hours and 2400 hours on the south bank and between 1800 hours and 2400 hours on the north bank (Appendices A.4 and A.5 and Figure 9). The pattern of increased rate of passage primarily during the evening hours was consistent with results from previous years.

There was no apparent preference exhibited by migrating sockeye salmon for one side of the river in 1987 (Table 5). The peak sockeye salmon passage date of 21 July on the north bank and 23 July on the south bank (Appendices A.6 and A.7) both fell within a 6 d period of daily escapements exceeding 100,000 fish. The midpoint of the run occurred approximately 5 d later than the mean midpoint of 20 July, for the previous 8 years (range of 14 July to 25 July). Eighty percent of the escapement passed the sonar counters in a period of 14 d (Table 6), typical of the migration timing exhibited over the previous 8 years, and an indication that the magnitude of the run did not affect in river migratory timing.

A total of 4,536 sockeye salmon were captured in fish wheels (Appendix A.8). Length and weight data were obtained from 745 and 441 fish, respectively. The mean length and weight of fish from the predominant age class (1.3) were significantly larger than comparable values recorded in all but one (1983) of the previous eight years (Appendices A.9 and A.10).

Age composition samples were collected from 15-21 July, when approximately 20% of the escapement passed the sampling site. This sample was used to characterize the entire escapement. The resultant age structure was made up predominantly of age-1.3 (78.4%), with lesser contributions by age-1.2 (12.8%) and age-2.3 (5.3%) fish (Table 7). In general, the age-1.3 fish were bound primarily for Quartz Creek, the Kenai mainstem and the shorelines and outlets of Kenai and Skilak Lakes. Fish bound for Russian River were predominantly age-2.2 (Hammarstrom and Athons 1988), and fish bound for Hidden Lake were predominantly age-1.2 (Todd and Kyle 1987).

Sonar counts attributed to sockeye salmon appear to be a relatively accurate measurement of escapement within the Kenai River drainage. The magnitude of the run and short duration of entry are ideal for counting with the Bendix system. The entry pattern of sockeye salmon into the drainage is also earlier than that of coho salmon and pink salmon. Finally, the extreme difference in run size between sockeye salmon and chinook salmon suggests that errors in estimating species composition (e.g., counting chinook salmon as sockeye salmon) does not appreciably alter the estimate of sockeye salmon escapement.

Pink, coho, and chinook salmon escapement estimates reported in Appendix A.1 were considered to be minimal. Run timing, counter limitations, and spawning site locations relative to the sonar site were factors discussed in Tarbox et al. (1981 and 1983) which influence accuracy of escapement estimates for these species. No additional pink and coho salmon escapement estimates were made for the mainstem Kenai River, but available information concerning tributary spawning populations is summarized in Table 4. The total inriver escapement of chinook salmon estimated using mark/recapture techniques was 82,437, consisting of 29,361

early run fish and 52,786 late run fish. Of these totals, the escapement after sport fish harvest was 16,370 early-run fish and 40,460 late-run fish (Hammarstrom 1988; Nelson 1987).

Kasilof River

A total of 259,733 fish were counted at the Kasilof River sonar site from 13 June through 7 August, 1987 (Appendix A.11). The sockeye salmon estimate of 238,202 was expanded to account for fish migration into the system prior to 13 June, resulting in a total sockeye escapement estimate of 249,246 fish (Table 1). This level of escapement approximated the upper bound of the desired sockeye salmon escapement goal range (150,000-250,000) established prior to the 1986 season. The estimated number of natural spawners (sonar estimate minus fish used for artificial propagation of Tustumena Lake) was 239,381 fish (Table 8).

The ADF&G Fisheries Rehabilitation, Enhancement, and Development Division (FRED), Crooked Creek Hatchery contribution to the sockeye escapement was estimated to be 28.4% (Kyle 1987).

Approximately 68% of the estimated sockeye salmon escapement was enumerated in tributaries of Tustumena Lake (Table 9). Seventy-eight percent of the counted tributary spawners entered Bear and Glacier Flat Creeks (Table 10). However, it should be noted that Bear and Glacier Flat Creek counts are total escapement counts as opposed to peak counts for the other tributaries.

Hatchery contribution varied by spawning tributary, accounting for an estimated 47.8% and 60.5% of the adult sockeye salmon returning to Bear Creek and Glacier Flats Creek. It was assumed that all of the hatchery fish returned to these two tributaries from which they were released. Kyle (1987) found that the proportion of spawners entering Glacier Flat Creek has increased substantially, and the proportion entering Nicholai Creek has decreased since the first year of major hatchery returns (1984).

Run timing information indicated that the midpoint of the sockeye salmon escapement occurred on 13 July, 1 d prior to the mean date (range 1-22 July) for the previous 8 years (Table 11).

Eighty percent of the escapement occurred in 41 d which was 9 d longer than the mean for the previous 8 years. Total run duration in this system is typically extended over a 60 d period with less than 5% of the cumulative total passing the counters on any one day. The extended period to achieve 80% of the escapement in 1987, as in 1980 (44 d), was the result of a bimodal entry pattern which was also apparent in the commercial harvest.

Fifty-five percent of the fish enumerated occurred on the north bank at the sonar site (Table 5; Appendices A.12 and A.13). Shore orientation showed a tendency for more offshore distribution early in the season (Appendices A.14 and A.15). As the season progressed, the proportion of fish nearshore (within 6 m) exceeded 70%.

Throughout the enumeration period, however, there appeared to be a tendency for the counter to undercount fish in the middle sectors (primarily sectors 4 through

8), although oscilloscope observations indicated that returning echoes from these fish were of sufficient amplitude and duration to count. In order to provide the most accurate estimate of escapement, the pulse repetition rate of the counter was set so that fish that undercounted in the middle sectors were compensated for by overcounting in other sectors. These counter adjustments biased the results of shore orientation analysis to some unmeasured degree.

Hourly distribution of counts are presented in Appendices A.16 and A.17 and Figure 10. When hourly proportions were compared to the expected mean proportion for a constant passage rate (4.16%) there was a slight preference for travel between 2000 h and 0300 h. Increased nocturnal passage rate however, was not consistent throughout the season. In-season observations revealed fluctuations in hourly counts which might indicate that some unknown factor may have influenced hourly passage rates.

A total of 3,910 sockeye salmon were captured in the Kasilof River fish wheel from 30 June through 6 August (Appendix A.18). Age composition of the escapement was estimated to be 43.4% age-1.2, 27.4% age-1.3, and 22.4% age 2.2 fish (Table 12). Kyle (1987) reported age-2.2 proportions for Bear Creek and Glacier Flat Creek of 16% and 13%, respectively. These data, when compared to the weighted age composition of the total escapement, indicated a significant difference between enhanced and nonenhanced tributaries relative to the age-2.2 fish. With the exception of 1986, this phenomenon has been observed every year since the first large returns of hatchery fish to the system. In addition, Flagg et al. (1987) found that age-1. hatchery fish smolted at a higher rate than wild stocks.

Chi-square analysis of age composition over time revealed an increase in the proportion of age-1.2 fish and a decrease in the proportion of age-1.3 fish as the season progressed. Examination of the changes between sampling periods (Table 13) revealed that significant ($\alpha = 0.05$) change occurred when all periods were tested (chi-square = 9.49, $P < 0.05$, 4 df). Testing between periods also resulted in significant test statistics (chi-square = 5.99, $P < 0.05$, 2 df). The pattern of an increase in the proportion of age-1.2 fish with a corresponding decrease in the proportion of age-1.3 fish appears to be consistent from year to year.

Sockeye salmon average length and weight data by age class, and sex ratios (males to females) are presented in Appendices A.19 and A.20. Mean values were within the range of data collected over the previous eight seasons.

Run timing, counter limitations, and spawning locations below the sonar site are factors which prevented escapement estimates for Kasilof River pink, coho and chinook salmon. Weir counts of chinook salmon and coho salmon were conducted by FRED on Crooked Creek (a lower river tributary of the Kasilof River). An escapement of 3,724 chinook salmon of Crooked Creek origin was estimated in 1987 (Kyle and Litchfield 1987). The coho salmon count at the weir was 3,348 (Gary Kyle, ADF&G, Soldotna, personal communication).

It appears from the data gathered that fish targets attributed to sockeye salmon are a relatively accurate measure of the escapement of this species into the Kasilof River. Shore- and bottom-oriented migratory behavior, likely a result of relatively high water velocities found at this site, were conducive to counting with the Bendix counter. Additionally, the predominance of sockeye salmon in fish wheel catches indicated this was primarily a single species system

during the monitoring period, and finally, documented sockeye salmon spawning areas are above the sonar site.

Crescent River

A total of 130,628 fish were enumerated entering Crescent River from 1 July through 7 August 1987 (Appendix A.21). Species composition of the sonar count was based on a total gill net catch of 217 salmon (Appendix A.22). The cumulative sockeye salmon estimate through 6 August was considered to be the total estimate of sockeye salmon escapement. Counts accumulated on 7 August were not included because 7 of 10 fish captured on that date were chum salmon; if included, the catch would have influenced the species composition of the sonar counts back to 24 July. It was therefore assumed that the majority of fish entering the river after 6 August were chum salmon and that the sockeye salmon escapement was effectively over by that date. The resultant sockeye salmon escapement estimate was 118,896 fish. The escapement goal for this system is 50,000 to 100,000 fish (King and Tarbox 1986).

As in previous years, fish movement at this site was concentrated very close to shore, with over 93% of the north bank and 97% of the south bank counts within approximately 2.5 m of the transducer (Appendices A.23 and A.24). Fish movement occurred primarily between 1200 hours and 2200 hours on the both banks (Appendices A.25 and A.26 and Figure 11). Shore orientation and hourly distribution were similar to the range of historical data collected at the Crescent Lake outlet and the current lower river sites.

The midpoint of the escapement occurred on 19 July, 1 d later than the mean date at the lower river from 1984-85 (Table 14), and 4 d prior to the peak passage date. Eighty percent of the escapement passed the site in 21 d, the low end of the range of values for this parameter (21-30 days). As in past years, the majority (64%) of the fish were counted on the north bank (Table 5 and Appendices A.27 and A.28). In contrast to previous years when there was a relatively constant passage rate of 2% to 3% of the escapement entering the river each day, approximately 20% of the escapement was counted in 2 days (22-23 July) in 1987.

A total of 191 sockeye salmon were sampled for age, length, and weight data. Estimated age structure of the escapement was 47.7% age-1.3 fish and 45.0% age-2.3 fish (Table 15). Small sample sizes resulted in 95% confidence intervals of 7.1% for the two major age classes. Average length and weight by sex and age class, and the ratio of males to females for sockeye salmon collected are presented in Appendices A.29 and A.30. As at the Kenai site, fish captured in 1987 were significantly larger in length than fish sampled previously.

Concentration of fish passage inshore and near bottom indicated that most fish were ensonified by the Bendix counters. In addition, fish passage occurred primarily during the daylight hours when counter accuracy could be measured by visual observation. Other factors entering the process of evaluating the accuracy of the sockeye salmon escapement estimate were the absence of other species of salmon in the sampling program for most of the operating period, and the absence of known sockeye salmon spawning sites downriver of the site. These factors indicate that the sockeye salmon escapement estimate for the counting period was probably reasonable. It should be noted, however, that the number of fish

captured was insufficient to estimate species composition frequently enough to identify the overlap in run timing of sockeye salmon and chum salmon.

Susitna River

Escapement estimates provided by hydroacoustic methods were limited to the Yentna River drainage in 1987. These escapement monitoring activities were conducted at Yentna Station, approximately 10 km upstream of the confluence of the Yentna and Susitna Rivers. Stream survey and weir counts for tributaries of the mainstem Susitna River are also provided where known.

Sockeye Salmon

During the period of 1 July through 14 August, 174,694 fish were enumerated in the Yentna River (Appendix A.31) of which 66,053 were estimated to be sockeye salmon. The sockeye salmon total was approximately 66% of the desired minimum escapement (100,000) for the tributary drainage. Spawning ground survey information for other Susitna River tributaries is presented in Table 16. Counts from a weir placed at the outlet of Larson Lake (17,585 sockeye salmon) were the only complete sockeye salmon escapement information collected from tributaries of the mainstem Susitna River above its confluence with the Yentna River. Annual aerial surveys of sockeye salmon index areas were discontinued in 1986 for budget reasons.

The midpoint of the return to the Yentna River passed the counters on 27 July, 2 d after the peak passage date (Table 17). Run timing, as measured by the midpoint, was approximately 5 d later than the mean for the previous 6 years. The south bank sockeye salmon count, which contributed 90% of the total (Table 5), peaked on 24 July, 2 d prior to the north bank (Appendices A.32 and A.33). Eighty percent of the escapement passed the counters in 17 d (Table 17), 5 d longer than the mean duration from 1981-86.

Analysis of south bank salmon escapement spatial distribution indicated that >90% of the fish counted during the peak of sockeye escapement (16 July through 9 August) were within 6 m of the transducer (Appendix A.34). In contrast, fish passing the north bank were observed throughout the counting range, although greater than 70% of the counts were recorded within the first four counting sectors (Appendix A.35). As at other sites, field observation indicated that a portion of the inshore and offshore sector counts were compensatory for fish undercounting in the middle sectors. Fish passage on both banks was relatively evenly distributed throughout the day (Appendices A.36 and A.37 and Figure 12).

Fish wheel catches at Yentna Station are presented in Appendices A.38 and A.39. A total of 3,609 sockeye salmon were captured, of which 1,089 were used for AWL analysis. The age structure of the escapement consisted of 50.6% age-1.3, 23.3% age-1.2, and 11.7% age-2.3 fish (Table 18). Analysis of age composition information revealed that there was a significant difference in proportion of the major age classes over time (Table 19). As in 1986 there was a relatively high percentage of freshwater age-0. fish in the return (3.7% of the adults sampled were age 0.2 and age 0.3). The only known spawning area not in proximity to a lake rearing environment is the headwaters of the West Fork of the Yentna

River. Juveniles from this portion of the drainage apparently migrate seaward at emergence, although it is not known if any time is spent rearing in the mainstem Yentna River. Parent year adult returns to this spawning area were estimated at 6,000-10,000 in 1983 and 1984, and were among the largest spawning populations observed.

Calculated mean length and weight of sockeye salmon by age class and sex, as well as ratio of males to females are presented in Appendices A.40 and A.41. As at other sites there appeared to be an increase in size of fish sampled in 1987 relative to previous years.

Pink Salmon

The pink salmon escapement estimate at Yentna Station in 1987 was 84,099 (Appendix A.31). No additional data were available from the mainstem Susitna River above the confluence with the Yentna River. The 1985 parent year escapement into the Yentna River for this year class was estimated at 120,990.

The daily pink salmon count recorded at Yentna Station peaked on 27 July, the same date as the midpoint of the total pink salmon count (Table 20). The midpoint of the return of this species has occurred on 27 or 28 July (range: 22-28 July) in 5 of the previous 7 years, demonstrating a higher degree of consistency in migratory timing than other salmon species entering the drainage. Eighty percent of the pink salmon escapement was recorded in 20 d, slightly longer than typical run duration for pink salmon escapements in previous years. Migratory behavior analysis indicates that, as with sockeye salmon, nearly all of the pink salmon were within 6 m of the transducer (Appendices A.34 and A.35). No differences were detected in fish passage relative to time of day (Appendices A.36 and A.37 and Figure 12). No AWL data were collected from pink salmon entering the Yentna River.

Chum Salmon

Chum salmon counts at Yentna Station numbered 17,858 in 1987 (Appendix A.31). The total was within the range of counts recorded for this species by 14 August in years since 1981 (7,852-25,889). No information was available on escapements of this species into specific spawning grounds or other major tributaries of the Susitna River.

Complete migratory timing information for chum salmon was not available from Yentna Station due to cessation of enumeration activities in mid-August. However, in the years 1981-84 when counting efforts extended into September, a range of 72% to 93% of the chum salmon counts were recorded by 14 August. However, the peak daily count of chum salmon in 1987 occurred on 10 August, 9 d later than the peak date for the year (1984) of the latest escapement on record at this site. No AWL data were collected from chum salmon entering the Yentna River.

Coho Salmon

The coho salmon sonar count at Yentna Station numbered 6,277 in 1987 (Appendix A.31). The estimated escapement was the lowest total on record, and the lowest cumulative escapement through mid-August for Yentna Station. Escapement counts from selected tributaries of the Susitna River conducted by the Division of Sport Fisheries are summarized in Table 16.

As with chum salmon, migratory timing information at Yentna Station was not available for this species. In the years 1981-84, 81% to 91% of the estimated coho salmon escapement occurred prior to 14 August. The relative abundance of other species migrating concurrent to coho salmon during peak periods effectively masked additional migratory behavior data collected by sonar for this species. No AWL data were collected from coho salmon entering the Yentna River.

Chinook Salmon

Chinook salmon escapement estimates have not been generated using hydroacoustic equipment at Susitna Station since 1978. Migratory behavior not conducive to enumeration by side-scan sonar and early run timing in comparison to other salmon species, are the primary reasons for the lack of an enumeration program.

Stream survey information compiled by the Sport Fish Division and Cook Inlet Aquaculture Association included 51,342 chinook salmon fish counted in selected tributaries of the drainage (ADF&G 1986). This total was considered a minimum estimate because not all potential spawning grounds were surveyed, and the methodology did not lend itself to complete enumeration of all spawners within streams surveyed. Individual tributary counts are presented in Table 16.

Evaluation of Data

Various factors affecting the accuracy of sonar counts by species in the Yentna and Susitna Rivers have been discussed in previous reports (King and Tarbox 1987, 1988) including equipment siting criteria, species shore orientation and crossover behavior, and fish wheel selectivity. Despite the potential problems discussed in these reports, it is felt that the existing sonar system provides a reasonably good indicator of the sockeye escapement into the Yentna River. River velocities comparable to the Kenai and Kasilof sites seem adequate to orient fish close to shore. Run timing appears to fall primarily within the confines of the existing operation dates, keeping modeling of the postenumeration segment of the escapement to a minimum. In addition, work by Thompson and Barrett (1983) suggested that fish wheel catches were a reasonably accurate measure of the proportion sockeye salmon passing their sampling sites. Estimates of escapement of other species should be viewed as indices given the potential for enumeration problems in this drainage.

The minimum counted sockeye salmon escapement, defined as the total of Yentna Station sonar counts and the weir count from Larson Lake, was 83,638 sockeye salmon. In the last 2 years of the Susitna Hydroelectric Project (1984-85), escapement counts from the above two sites accounted for 66% and 64% of the combined Yentna Station/Sunshine Station sockeye salmon total. Some proportion of the total river sockeye salmon escapement also spawns in tributaries below the confluence of the Talkeetna and Susitna Rivers.

Upper Cook Inlet Minor Systems

Escapement estimates for various Upper Cook Inlet rivers (Figure 1) not regularly monitored by Commercial Fisheries Division staff are summarized in Table 21. Additional detail is provided for systems where an effort was made to quantify total escapement, or where index areas have been established to provide relative year to year comparative data.

Fish Creek (Big Lake)

Salmon enumeration was accomplished primarily through a weir operated below Big Lake. Final escapement counts were 91,215 sockeye salmon and 3,871 coho salmon (Chlupach, ADF&G, FRED Division, Palmer, Alaska, personal communication). Migratory timing information and age composition data for sockeye salmon spawning in this drainage are presented in Tables 22 and 23. Additional information on AWL data can be found in Waltemeyer (1988).

The midpoint of the escapement occurred on 26 July, 1 d later than the mean for the previous 7 years, and 5 d earlier than the previous 2 years. The early run timing relative to 1985 and 1986 was not apparent at other enumeration sites, particularly the Yentna River. Generally, timing past the Yentna site precedes the Fish Creek site by 3-5 d, however in 1987 the midpoint of the return to Fish Creek occurred 1 d earlier. These data may reflect an earlier or quicker passage of sockeye salmon bound for Fish Creek through the district, or may be a function of the terminal harvest area catch of approximately 24,000 fish which occurred from 27-29 July.

Packers Lake (Kalgan Island)

A total of 35,401 sockeye salmon were counted through a weir established below the outlet of Packers Lake (Marcuson, Cook Inlet Aquaculture Association, Soldotna, Alaska, personal communication). AWL information collected from the spawning population were presented in Waltemeyer (1988).

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TABLES AND FIGURES

Table 1. Estimated sockeye salmon escapement derived from side-scanning sonar in the Kenai, Kasilof, Crescent, and Susitna Rivers, 1978-1987.

Year	System			
	Kenai R. ^a	Kasilof R. ^b	Crescent R.	Susitna R. ^c
1978	398,900	116,600	d	94,400
1979	285,020	152,179	86,654	156,890
1980	464,038	187,154	90,863	190,866
1981	407,639	256,625	41,213	340,232
1982	619,831	180,239	58,957	215,856 ^e -265,332 ^f
1983	630,340	210,270	92,343	112,314-175,936 ^f
1984	344,571	231,685	118,345	194,480 ^e -279,446 ^f
1985	502,820	505,049	128,628	227,924 ^f
1986	501,157	275,963	20,385	92,077 ^h
1987	1,596,870	249,246	118,896	66,053 ^h

^a Includes counts after June 22 only.

^b Includes counts or estimates from designated early period (prior to 15 June).

^c Sonar counts from Susitna Station unless otherwise indicated.

^d No counts conducted.

^e Sonar counts from Yentna Station and Susitna Station east bank.

^f Sonar counts from Yentna Station and mark/recapture estimate from Sunshine Station.

^g Counts through 16 July only.

^h Counts from Yentna Station only.

Table 2. Late-run Kenai River sockeye salmon escapement summary, 1968-87.

Year	Estimated Escapement at Sonar Site ^a	Russian River Sport Harvest ^b	Kenai River Mainstem Sport Harvest ^b	Estimated Total Harvest Above Sonar Site ^c	Sonar Count Less Sport Harvest ^d
1968	88,000	5,820			
1969	53,000	1,150			
1970	73,000	600			
1971		10,730			
1972	318,000	16,050			
1973	367,000	8,930			
1974	161,000	8,500	8,030	16,530 ^e	144,470
1975	142,000	8,390	5,110	13,500 ^e	128,500
1976	380,000	13,700	13,140	26,840 ^e	353,160
1977	708,000	27,440	16,933	44,373 ^e	663,627
1978	398,900	24,530	24,542	49,072 ^e	349,828
1979	285,020	26,830	12,328	39,158 ^e	245,862
1980	464,038	33,490	18,592	52,082 ^e	411,956
1981	407,639	23,720	14,451	38,171	369,468
1982	619,831	10,321	38,397	48,718	571,113
1983	630,340	16,000	48,306	64,306	566,034
1984	344,571	21,970	11,280	33,250	311,321
1985	502,820	58,410	42,272	11,682	491,138
1986	501,157	30,813	51,221	82,034	419,123
1987	1,596,870	40,575 ^f	160,000 ^f	200,575 ^f	1,396,295

^a Bendix Corp. multiple transducer sonar 1968-77, side-scanning sonar 1978-87.

^b Data from Sport Fish Division Statewide Harvest estimate. Mainstem harvest above the Soldotna bridge (and sonar site) only.

^c Combined Russian River and mainstem (above bridge) harvests.

^d Considered estimate of spawners above sonar site.

^e Cross et al. 1983.

^f Preliminary.

Table 3. Late-run sockeye salmon escapement counts in eight index areas, Kenai River drainage, 1969-87.

Year	Railroad Creek	Johnson Creek	Carter-Moose Creek	Ptarmigan Creek	Tern (Mud) Lake	Quartz Creek	Hidden Lake ^a	Russian River ^b	Total Index Area Escapement
1969	100	75	598	5	487	487	500	30,020	32,272
1970	99	118	348	7	561	200	323	28,420	30,076
1971	194	160	3,201	45	1,370	808	1,958	64,430	72,166
1972	700	150	3,400	c	1,200	c	4,956	85,000	95,406
1973	521	1,714	660	1,041	1,731	3,173	690	31,660	41,190
1974	c	46	939	558	c	255	1,150	26,860	29,808
1975	522	105	1,278	186	1,214	1,068	1,375	32,600	38,348
1976	1,032	c	5,558	c	1,548	3,372	4,860	35,420	51,790
1977	1,262	450	6,515	1,513	2,230	3,037	1,055	38,500	54,562
1978	1,749	780	1,933	3,529	1,126	10,627	4,647	52,560	76,951
1979	c	588	3,986	523	1,693	277	5,762	91,840	104,669
1980	1,259	253	4,879	5,752	2,575	7,982	27,448	87,200	137,348
1981	1,276	142	4,370	1,421	3,402	5,998	15,939	48,690	81,238
1982	2,518	498	4,752	7,525	4,300	70,540 ^d	8,648	75,630	174,411
1983	1,289	338	1,819	9,709	c	73,345 ^d	11,297	78,000	175,797
1984	2,090 ^e	939 ^e	5,927 ^e	18,000 ^e	2,728 ^e	37,659 ^e	27,792	95,660	190,795
1985	2,884 ^e	151 ^e	5,928 ^e	26,879 ^e			24,784	145,620	206,246
1986	600 ^e	245 ^e	1,659 ^e	c	c	c	17,530	46,422	66,456
1987	736 ^f	74 ^f	625 ^{f,g}	14,187 ^f		45,400	43,487	130,462	234,971

^a Weir count: 1971, 1973, 1976-87.

^b Includes weir count of fish entering Lower Russian Lake and peak count of escapement below falls.

^c No counts conducted.

^d FRED Division weir count.

^e Ralph Browning, United States Department of Agriculture, Forest Service, Seward, Alaska, personal communication.

^f Dan Logan, United States Department of Agriculture, Forest Service, Seward, Alaska, personal communication. With the exception of Ptarmigan Creek, a single survey was in the last week of September.

^g One-half of the index area surveyed.

Table 4. Salmon escapement counts conducted on selected tributaries of the Kenai River, 1987.

Location	Method	Peak Count			
		Sockeye	Pink	Coho	Chinook
Johnson Creek ^a	Stream Count			23	
Ptarmigan Creek ^a	Stream Count				12
Railroad Creek ^a	Stream Count			11	
Russian River ^b	Weir	61,515			
Snow River ^c	Aerial Count	5,000			

^a Dan Logan, United States Department of Agriculture, Forest Service, Seward, Alaska, personal communication.

^b Sockeye salmon count includes early run only (Hammarstrom and Athon 1988)

^c Pat Marcuson, Cook Inlet Aquaculture Association, Soldotna, Alaska, personal communication.

Table 5. Bank distribution of sockeye salmon escapement derived from side-scanning sonar in the Kenai, Kasilof, Crescent, and Yentna Rivers, 1981-87.

	Percent of Total Fish Targets						
	1981	1982	1983	1984	1985	1986	1987
Kenai River							
North Bank	72	39	42	65	54	62	48
South Bank	28	61	58	35	46	38	52
Kasilof River							
North Bank	69	73	51	56	70	57	55
South Bank	31	27	49	44	30	43	45
Crescent River							
North Bank	57	54	39	71	70	84	64
South Bank	43	46	61	29	30	16	34
Yentna River							
North Bank					9	32	10
South Bank					91	68	90

Table 6. Cumulative proportion by date of late-run sockeye salmon escapement in the Kenai River, 1979-87.

Date	Cumulative Proportion ^a								
	1979	1980	1981	1982	1983	1984	1985	1986	1987
22-Jun	0.001	0.002	0.001	0.002	0.001	0.003	0.001	0.001	0.001
23-Jun	0.003	0.004	0.001	0.003	0.001	0.007	0.002	0.002	0.002
24-Jun	0.006	0.005	0.002	0.004	0.002	0.010	0.003	0.003	0.002
25-Jun	0.008	0.006	0.003	0.004	0.003	0.012	0.004	0.004	0.002
26-Jun	0.010	0.008	0.004	0.005	0.004	0.013	0.005	0.004	0.003
27-Jun	0.012	0.008	0.006	0.006	0.005	0.015	0.006	0.005	0.004
28-Jun	0.013	0.009	0.007	0.007	0.006	0.017	0.007	0.006	0.005
29-Jun	0.015	0.010	0.008	0.007	0.006	0.018	0.009	0.007	0.006
30-Jun	0.017	0.011	0.009	0.008	0.007	0.021	0.010	0.008	0.007
01-Jul	0.019	0.012	0.010	0.009	0.007	0.023	0.014	0.009	0.007
02-Jul	0.020	0.013	0.012	0.010	0.008	0.024	0.016	0.010	0.008
03-Jul	0.023	0.014	0.012	0.011	0.008	0.025	0.017	0.011	0.008
04-Jul	0.025	0.015	0.013	0.011	0.009	0.027	0.019	0.012	0.008
05-Jul	0.030	0.016	0.013	0.012	0.009	0.029	0.021	0.013	0.009
06-Jul	0.050	0.016	0.014	0.012	0.009	0.031	0.024	0.014	0.009
07-Jul	0.067	0.017	0.016	0.013	0.010	0.032	0.026	0.016	0.009
08-Jul	0.077	0.017	0.018	0.013	0.010	0.036	0.030	0.016	0.010
09-Jul	0.082	0.018	0.064	0.015	0.011	0.044	0.032	0.016	0.010
10-Jul	0.086	0.018	0.186	0.016	0.013	0.054	0.033	0.017	0.010
11-Jul	0.089	0.019	0.262	0.016	0.017	0.063	0.036	0.017	0.011
12-Jul	0.092	0.020	0.366	0.017	0.021	0.067	0.038	0.018	0.011
13-Jul	0.095	0.020	0.463	0.019	0.041	0.071	0.039	0.020	0.015
14-Jul	0.100	0.021	0.512	0.021	0.085	0.073	0.048	0.044	0.018
15-Jul	0.126	0.027	0.549	0.026	0.174	0.076	0.066	0.057	0.033
16-Jul	0.170	0.057	0.559	0.047	0.242	0.112	0.104	0.068	0.044
17-Jul	0.238	0.310	0.572	0.067	0.297	0.173	0.111	0.081	0.052
18-Jul	0.342	0.489	0.605	0.182	0.437	0.307	0.114	0.095	0.058
19-Jul	0.504	0.607	0.667	0.322	0.566	0.363	0.115	0.114	0.070
20-Jul	0.670	0.777	0.747	0.474	0.695	0.406	0.116	0.126	0.142
21-Jul	0.795	0.899	0.803	0.563	0.766	0.464	0.120	0.194	0.237
22-Jul	0.840	0.920	0.835	0.598	0.796	0.555	0.178	0.300	0.322
23-Jul	0.872	0.926	0.848	0.642	0.813	0.652	0.291	0.359	0.409
24-Jul	0.888	0.932	0.864	0.681	0.833	0.720	0.463	0.426	0.493
25-Jul	0.913	0.935	0.876	0.722	0.844	0.781	0.574	0.525	0.575
26-Jul	0.925	0.938	0.894	0.752	0.861	0.833	0.693	0.689	0.646
27-Jul	0.931	0.944	0.911	0.842	0.865	0.867	0.753	0.814	0.700
28-Jul	0.934	0.947	0.921	0.883	0.872	0.897	0.822	0.874	0.747
29-Jul	0.939	0.952	0.932	0.903	0.878	0.913	0.864	0.910	0.774
30-Jul	0.945	0.955	0.940	0.918	0.882	0.921	0.897	0.961	0.797
31-Jul	0.950	0.957	0.948	0.931	0.891	0.928	0.911	1.000	0.839

- Continued -

Table 6. (p 2 of 2)

Date	Cumulative Proportion ^a								
	1979	1980	1981	1982	1983	1984	1985	1986	1987
01-Aug	0.953	0.960	0.955	0.940	0.906	0.933	0.919		0.879
02-Aug	0.955	0.962	0.964	0.946	0.916	0.937	0.922		0.907
03-Aug	0.958	0.964	1.000	0.951	0.920	0.943	0.925		0.925
04-Aug	0.961	0.966		0.955	0.934	0.948	0.929		0.939
05-Aug	0.965	0.968		1.000	0.964	0.956	0.931		0.952
06-Aug	0.968	0.970			0.977	0.960	0.935		0.962
07-Aug	0.971	0.972			0.983	0.963	0.938		0.970
08-Aug	0.973	0.974			0.989	0.969	0.943		0.976
09-Aug	0.977	0.975			0.993	1.000	0.947		0.981
10-Aug	0.981	0.978			0.996		0.953		0.988
11-Aug	0.987	0.982			0.999		0.960		0.994
12-Aug	0.993	0.985			1.000		1.000		0.998
13-Aug	0.995	0.992						1.000	
14-Aug	0.996	0.993							
15-Aug	1.000	0.993							
16-Aug		0.995							
17-Aug		0.996							
18-Aug		0.997							
19-Aug		0.997							
20-Aug		0.997							
21-Aug		0.998							
22-Aug		0.998							
23-Aug		0.999							
24-Aug		0.999							
25-Aug		0.999							
26-Aug		0.999							
27-Aug		0.999							
28-Aug		1.000							
29-Aug		1.000							
30-Aug		1.000							
31-Aug		1.000							
01-Sep		1.000							
02-Sep		1.000							
03-Sep		1.000							
04-Sep		1.000							

^a Proportion accrued on last day (1981, 1982, 1984-86) represents that portion of the escapement estimated after termination of enumeration activities.

Table 7. Age composition of sockeye salmon in the Kenai River, 1970-87.

Year	Percent Composition by Age Class ^{a,b}								Sample Size
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	Other	
1970	tr	10.0	17.0	tr	26.0	25.0	15.0	6.0	225
1971	0.0	8.0	39.0	1.0	3.0	38.0	11.0	0.0	168
1972	0.0	21.0	34.0	0.0	0.0	23.0	20.0	0.0	403
1973	0.0	5.0	68.0	1.0	1.0	8.0	16.0	0.0	632
1974	2.0	18.0	46.0	0.0	3.0	18.0	12.0	0.0	295
1975	2.0	10.0	36.0	2.0	4.0	31.0	14.0	1.0	162
1976	1.0	46.0	20.0	0.0	2.0	22.0	8.0	1.0	948
1977	0.0	6.0	76.0	1.0	tr	7.0	10.0	0.0	1,265
1978	0.0	2.5	86.7	0.0	0.0	4.9	5.4	tr	811
1979	tr	20.2	61.1	0.0	0.0	11.8	6.2	tr	601
1980	0.0	27.7	45.1	0.0	0.0	16.2	10.1	tr	715
1981	0.0	16.2	70.9	0.0	0.0	8.1	4.8	0.0	1,757
1982	0.1	5.8	87.5	tr	0.0	2.9	3.7	0.0	1,787
1983	0.4	8.2	79.1	0.2	0.5	2.2	8.9	0.4	1,765
1984	0.2	23.4	38.2	3.5	0.6	12.8	19.2	2.2	2,364
1985	0.1	15.9 (2.0)	56.4 (2.7)	0.3	0.1	14.7 (1.9)	11.4 (1.7)	1.1	2,201
1986	0.0	31.8 (3.2)	39.5 (3.4)	0.7	0.3	8.2	18.0 (2.7)	1.5	789
1987	0.0	12.8 (2.4)	78.4 (3.4)	0.1	0.0	3.2	5.2	0.3	745

^a Percentages weighted by total numbers of fish in the escapement: 1978 (Bethe et al. 1980), 1979-82, 1984-87.

^b 95% confidence interval +/- figures in parentheses.

Table 8. Kasilof River sockeye salmon escapement summary, 1968-87.

Year	Escapement Estimated by Sonar Count ^a	Fish used for Artificial Propogation of Tustumena Lake	Sonar Count Less Egg Take ^b
1968	89,000		
1969	46,000		
1970	38,000		
1971	--		
1972	113,000		
1973	40,000		
1974	70,000	205 ^c	69,795
1975	48,000	3,365	44,635
1976	139,000	5,463	133,537
1977	155,300	1,794	153,506
1978	116,600	6,681	109,919
1979	152,179	3,024	149,155
1980	187,154	6,030	181,124
1981	256,625	9,700 ^d	246,925
1982	180,239	11,571	168,668
1983	210,271	9,903	200,368
1984	231,685	11,141	220,544
1985	505,049	11,280	493,769
1986	275,963	11,952 ^e	264,011
1987	249,246	9,865 ^f	239,381

^a Multiple transducer sonar counts rounded to the nearest thousand (1968-77) from Namvedt et al. (1979). Side-scanning sonar counts (1979-81) from Tarbox et al. (1983).

^b Considered estimate of natural spawners above sonar site.

^c From Cross et al. (1983): 1974-80

^d Waite, ADF&G, FRED Division, Soldotna, Alaska, personal communication: 1981-85.

^e Litchfield, ADF&G, FRED Division, Soldotna, Alaska, personal communication.

^f Och, ADF&G, FRED division, Kasilof, Alaska, personal communication.

Table 9. Peak sockeye salmon escapement counts in seven index areas, Kaslof River drainage, 1975-87.

Year ^a	Nikolai Creek	Crystal Creek	Clear Creek	Glacier Flat Creek ^b	Seepage Creek	Moose Creek	Bear Creek ^b	Total Index Count
1975	5,700	400	300	14,400	3,700	3,300	27,700	55,500
1976	12,000	800	300	7,100	800	14,000	51,800	86,800
1977	29,100	600	1,800	5,800	800	16,600	58,000	112,700
1978	34,200	200	200	4,700	1,100	15,900	43,400	99,700
1979	19,100	500	400	5,600	800	8,100	35,900	70,400
1980	10,000	1,000	2,100	15,500	1,800	15,600	125,000	171,000
1981	36,000	860	2,978	40,071	3,376	12,968	75,117	171,370
1982	16,800	1,785	4,183	17,348	1,638	13,400	51,350	106,504
1983	17,100	1,657	860	38,776	3,305	19,245	61,957	142,900
1984	8,270	141	2,619	76,217	6,250	13,999	54,328	161,824
1985	17,500	800	3,500	121,400	5,700	9,200	120,400	278,500
1986 ^c	11,900	1,400	2,700	60,600	2,000	21,200	102,900	202,700
1987 ^d	9,002	1,385	7,704	61,000	791	17,601	71,250	168,733

^a Counts standardized to common unit for years when entire stream not surveyed.

Relative abundance per section (when entire system was surveyed) was used to extrapolate for years when only a portion of the stream was surveyed (1975-80). Numbers rounded to nearest hundred fish.

^b F.R.E.D. Division weir count, 1980-87.

^c Flagg, 1986. Numbers rounded to nearest hundred fish.

^d Kyle 1987.

Table 10. Distribution (percent of total index counts) of sockeye salmon in the major tributary systems of Tustumena Lake, 1975-87.

Year	Nikolai Creek	Moose Creek	Bear Creek	Glacier Flat Creek	Other
1975	10.2	5.9	49.9	25.9	8.1
1976	13.8	16.2	59.8	8.2	2.0
1977	25.8	14.7	51.5	5.1	2.9
1978	34.3	15.9	43.5	4.7	1.6
1979	27.1	11.5	51.0	7.9	2.5
1980	5.8	9.1	73.1	9.0	3.0
1981	21.0	7.6	43.8	23.3	4.3
1982	15.8	12.6	48.2	16.3	7.1
1983	12.0	13.5	43.4	27.1	4.0
1984	5.1	8.7	33.6	47.1	5.5
1985	6.0	3.0	43.0	44.0	4.0
1986	5.9	10.4	50.8	29.9	3.0
1987	5.3	10.4	42.2	36.2	5.9

Table 11. Cumulative proportion by date of sockeye salmon escapement in the Kaslof River, 1979-87.

Date	Cumulative Proportion ^a								
	1979	1980	1981	1982	1983	1984	1985	1986	1987
14-May			0.000						
15-May			0.001						
16-May			0.003						
17-May			0.003						
18-May			0.005						
19-May			0.006						
20-May			0.006						
21-May			0.007						
22-May			0.008						
23-May	0.000		0.008						
24-May	0.003		0.010						
25-May	0.004		0.011						
26-May	0.006		0.012						
27-May	0.008		0.013						
28-May	0.009		0.014						
29-May	0.011		0.015						
30-May	0.014		0.016						
31-May	0.017		0.018						
01-Jun	0.020		0.020						
02-Jun	0.023		0.022						
03-Jun	0.026		0.025						
04-Jun	0.030		0.027						
05-Jun	0.034		0.030						
06-Jun	0.036		0.032						
07-Jun	0.037		0.035						
08-Jun	0.039		0.038						
09-Jun	0.040		0.040		0.007				
10-Jun	0.041		0.043	0.001	0.045	0.008			
11-Jun	0.041		0.045	0.003	0.046	0.009			
12-Jun	0.042		0.047	0.005	0.048	0.011	0.002	0.037	0.044
13-Jun	0.043		0.049	0.007	0.050	0.012	0.003	0.041	0.051
14-Jun	0.044		0.051	0.008	0.051	0.013	0.003	0.045	0.062
15-Jun	0.044		0.055	0.010	0.053	0.015	0.004	0.048	0.073
16-Jun	0.045		0.059	0.011	0.056	0.018	0.004	0.053	0.091
17-Jun	0.046		0.064	0.013	0.058	0.020	0.005	0.059	0.106
18-Jun	0.048		0.075	0.015	0.060	0.022	0.005	0.062	0.120
19-Jun	0.049		0.082	0.027	0.063	0.025	0.006	0.066	0.146
20-Jun	0.051		0.099	0.035	0.065	0.031	0.007	0.068	0.171
21-Jun	0.054		0.114	0.040	0.068	0.039	0.007	0.071	0.190
22-Jun	0.060	0.003	0.133	0.043	0.070	0.048	0.008	0.073	0.198

- Continued -

Table 11. (p 2 of 3)

Date	Cumulative Proportion ^a								
	1979	1980	1981	1982	1983	1984	1985	1986	1987
23-Jun	0.066	0.007	0.162	0.045	0.074	0.058	0.009	0.074	0.201
24-Jun	0.077	0.009	0.195	0.049	0.076	0.069	0.012	0.075	0.206
25-Jun	0.093	0.022	0.223	0.053	0.078	0.075	0.015	0.077	0.212
26-Jun	0.108	0.035	0.261	0.055	0.080	0.080	0.017	0.079	0.218
27-Jun	0.125	0.051	0.288	0.058	0.082	0.089	0.019	0.082	0.222
28-Jun	0.153	0.075	0.342	0.061	0.085	0.099	0.022	0.085	0.227
29-Jun	0.169	0.094	0.389	0.064	0.090	0.111	0.025	0.095	0.238
30-Jun	0.196	0.136	0.438	0.069	0.110	0.123	0.029	0.121	0.249
01-Jul	0.229	0.166	0.500	0.078	0.153	0.136	0.035	0.153	0.267
02-Jul	0.248	0.217	0.512	0.091	0.165	0.150	0.039	0.180	0.297
03-Jul	0.281	0.250	0.522	0.104	0.188	0.157	0.044	0.198	0.317
04-Jul	0.325	0.280	0.529	0.115	0.212	0.178	0.056	0.215	0.334
05-Jul	0.374	0.314	0.534	0.122	0.221	0.217	0.066	0.228	0.357
06-Jul	0.404	0.338	0.543	0.129	0.231	0.243	0.071	0.245	0.385
07-Jul	0.458	0.353	0.551	0.136	0.240	0.263	0.078	0.257	0.403
08-Jul	0.473	0.366	0.562	0.145	0.247	0.304	0.095	0.261	0.422
09-Jul	0.496	0.379	0.604	0.156	0.263	0.358	0.103	0.269	0.438
10-Jul	0.509	0.393	0.649	0.164	0.294	0.391	0.114	0.289	0.450
11-Jul	0.519	0.413	0.677	0.177	0.315	0.411	0.119	0.323	0.456
12-Jul	0.532	0.421	0.712	0.197	0.344	0.416	0.126	0.337	0.481
13-Jul	0.550	0.426	0.746	0.217	0.395	0.427	0.148	0.430	0.508
14-Jul	0.579	0.436	0.797	0.247	0.465	0.445	0.208	0.501	0.520
15-Jul	0.629	0.464	0.838	0.293	0.514	0.484	0.267	0.513	0.587
16-Jul	0.643	0.528	0.863	0.358	0.547	0.543	0.382	0.528	0.600
17-Jul	0.674	0.570	0.877	0.404	0.663	0.590	0.418	0.544	0.608
18-Jul	0.703	0.609	0.891	0.491	0.759	0.636	0.432	0.562	0.619
19-Jul	0.730	0.649	0.904	0.577	0.775	0.693	0.436	0.575	0.699
20-Jul	0.755	0.693	0.922	0.642	0.785	0.739	0.439	0.586	0.731
21-Jul	0.767	0.715	0.936	0.702	0.804	0.778	0.464	0.601	0.765
22-Jul	0.781	0.738	0.942	0.744	0.822	0.810	0.551	0.611	0.809
23-Jul	0.848	0.775	0.947	0.759	0.833	0.832	0.609	0.618	0.851
24-Jul	0.860	0.788	0.952	0.769	0.842	0.864	0.649	0.627	0.873
25-Jul	0.875	0.803	0.954	0.784	0.849	0.888	0.683	0.717	0.888
26-Jul	0.896	0.818	0.957	0.800	0.854	0.910	0.733	0.795	0.897
27-Jul	0.910	0.830	0.959	0.818	0.858	0.918	0.791	0.806	0.906
28-Jul	0.930	0.840	0.962	0.836	0.862	0.926	0.826	0.812	0.916
29-Jul	0.941	0.853	0.963	0.847	0.867	0.933	0.842	0.829	0.925
30-Jul	0.947	0.864	0.964	0.857	0.874	0.939	0.853	0.888	0.939
31-Jul	0.954	0.878	0.966	0.866	0.889	0.943	0.865	0.917	0.962
01-Aug	0.957	0.889	1.000	0.876	1.000	1.000	0.875	1.000	0.975
02-Aug	0.963	0.900		0.886			0.881		0.982

- Continued -

Table 11. (p 3 of 3)

Date	Cumulative Proportion ^a								
	1979	1980	1981	1982	1983	1984	1985	1986	1987
03-Aug	0.966	0.906		0.895		0.890		0.986	
04-Aug	0.969	0.915		1.000		0.898		0.990	
05-Aug	0.980	0.925				0.904		0.994	
06-Aug	0.983	0.932				0.909		0.997	
07-Aug	0.986	0.939				0.917		1.000	
08-Aug	0.989	0.946				0.927			
09-Aug	0.991	0.961				0.938			
10-Aug	0.994	0.968				0.945			
11-Aug	0.998	0.979				0.949			
12-Aug	1.000	0.988				1.000			
13-Aug	1.000	1.000							

^a Proportion accrued on first day (1983-86) and last day (1981-86) represents that portion of the escapement estimated before and after enumeration activities.

Table 12. Age composition of sockeye salmon in the Kaslof River, 1969-87.

Sample Period	Percent Composition by Age Class ^{a,b}								Sample Size
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	Other	
6/13-7/10/87	0.0	35.8	37.5	0.0	0.0	16.8	9.9	0.0	578
7/11-7/24/87	0.2	48.1	22.3	0.0	0.0	25.1	4.3	0.0	511
7/25-8/1/87	1.3	54.1	8.8	0.0	0.6	33.3	1.3	0.6	159
Seasonal Summary									
1969	0.0	14.0	39.0	1.0	0.0	30.0	16.0	0.0	399
1970	tr	32.0	37.0	2.0	0.0	16.0	11.0	2.0	297
1971	0.0	6.0	69.0	0.0	0.0	8.0	16.0	1.0	153
1972	tr	42.0	36.0	1.0	tr	3.0	18.0	0.0	668
1973	0.0	20.0	57.0	0.0	0.0	19.0	4.0	0.0	374
1974	0.0	35.0	59.0	0.0	tr	4.0	2.0	0.0	254
1975	1.0	29.0	7.0	0.0	0.0	58.0	4.0	1.0	931
1976	tr	32.0	20.0	0.0	tr	35.0	12.0	1.0	755
1977	tr	30.0	30.0	0.0	1.0	28.0	11.0	0.0	1,209
1978	0.0	42.0	35.0	0.0	0.0	14.0	9.0	0.0	967
1979	0.0	52.2	37.2	0.0	tr	8.4	1.7	0.5	590
1980	0.0	58.7	27.8	0.0	0.0	8.0	4.5	1.0	899
1981	0.0	30.2	62.2	0.0	0.0	6.0	1.6	0.0	1,479
1982	1.0	34.0	49.5	0.0	0.1	10.7	4.7	0.0	1,518
1983	0.0	48.4	34.3	0.0	0.0	12.8	4.5	0.0	1,997
1984	0.0	50.5	24.8	tr	0.2	17.9	6.6	0.0	2,269
1985	0.2	57.3 (2.0)	21.8 (1.6)	0.1	0.1	17.8 (1.6)	2.6	0.1	3,063
1986	0.0	40.9 (2.2)	42.0 (2.1)	0.3	0.1	11.9 (1.6)	4.6	0.2	1,660
1987		43.4 (2.7)	27.4 (2.4)	0.0	0.1	22.4 (2.3)	6.4	0.3	1,248

^a Percentages weighted by total numbers in the escapement: 1979-87.

^b 95% confidence interval: +/- figures in parentheses.

Table 13. Summary of chi-square analysis of temporal change in Kaslof River sockeye salmon age composition, 1987.

Periods	Number of Age Classes	Chi-square Value					
		Calculated	Alpha	DF	Tabled Value	Significant?	Hypothesis
1-3	3	77.67	0.05	4	9.49	yes	reject
1-2	3	54.84	0.05	2	5.99	yes	reject
2-3	3	144.00	0.05	2	5.99	yes	reject

a Period 1: 6/13-7/10.

Period 2: 7/11-7/24.

Period 3: 7/25-8/7.

b Age classes: 1.2, 1.3, 2.2.

c Hypothesis: Age class structure is independent of time of sampling.

Table 14. Cumulative proportion by date of sockeye salmon escapement in the Crescent River, 1979-87.

Date	Cumulative Proportion								
	1979	1980	1981	1982	1983	1984	1985	1986	1987
15-Jun						0.000	0.000		
16-Jun						0.001	0.000		
17-Jun						0.002	0.000		
18-Jun						0.003	0.000		
19-Jun						0.003	0.000		
20-Jun						0.005	0.001		
21-Jun						0.008	0.001		
22-Jun						0.012	0.001		
23-Jun						0.017	0.001		
24-Jun						0.020	0.001		
25-Jun						0.024	0.001	0.000	
26-Jun						0.027	0.001	0.000	
27-Jun						0.036	0.002	0.000	
28-Jun	0.000					0.041	0.002	0.001	
29-Jun	0.000	0.000				0.049	0.005	0.005	
30-Jun	0.000	0.000				0.069	0.007	0.008	
01-Jul	0.004	0.000	0.000	0.000	0.000	0.081	0.008	0.017	0.012
02-Jul	0.025	0.000	0.012	0.000	0.000	0.100	0.012	0.031	0.016
03-Jul	0.037	0.000	0.036	0.001	0.001	0.118	0.016	0.054	0.020
04-Jul	0.051	0.000	0.061	0.001	0.002	0.140	0.057	0.077	0.023
05-Jul	0.059	0.000	0.083	0.002	0.019	0.156	0.138	0.084	0.027
06-Jul	0.068	0.000	0.097	0.002	0.041	0.170	0.188	0.094	0.058
07-Jul	0.079	0.000	0.117	0.005	0.068	0.184	0.196	0.110	0.084
08-Jul	0.091	0.000	0.149	0.021	0.098	0.225	0.226	0.126	0.112
09-Jul	0.107	0.000	0.166	0.057	0.118	0.268	0.251	0.134	0.160
10-Jul	0.182	0.029	0.180	0.098	0.137	0.322	0.274	0.144	0.193
11-Jul	0.268	0.089	0.193	0.127	0.167	0.360	0.293	0.154	0.243
12-Jul	0.327	0.126	0.202	0.157	0.207	0.387	0.319	0.165	0.269
13-Jul	0.395	0.132	0.215	0.190	0.266	0.409	0.364	0.184	0.305
14-Jul	0.423	0.145	0.234	0.217	0.338	0.425	0.388	0.197	0.333
15-Jul	0.462	0.161	0.266	0.245	0.392	0.454	0.415	0.204	0.370
16-Jul	0.488	0.176	0.311	0.258	0.431	0.499	0.445	0.213	0.386
17-Jul	0.511	0.193	0.347	0.286	0.457	0.548	0.480		0.406
18-Jul	0.537	0.228	0.386	0.328	0.499	0.599	0.506		0.448
19-Jul	0.572	0.286	0.434	0.377	0.559	0.639	0.525		0.513
20-Jul	0.610	0.370	0.493	0.460	0.617	0.684	0.546		0.548
21-Jul	0.673	0.455	0.550	0.533	0.667	0.721	0.573		0.593
22-Jul	0.731	0.520	0.604	0.586	0.702	0.743	0.596		0.671
23-Jul	0.779	0.596	0.655	0.636	0.732	0.783	0.632		0.773
24-Jul	0.807	0.651	0.703	0.685	0.764	0.802	0.665		0.819

- Continued -

Table 14. (p 2 of 2)

Date	Cumulative Proportion								
	1979	1980	1981	1982	1983	1984	1985	1986	1987
25-Jul	0.814	0.681	0.727	0.713	0.787	0.813	0.698	0.856	
26-Jul	0.820	0.721	0.741	0.751	0.813	0.824	0.729	0.877	
27-Jul	0.829	0.750	0.760	0.784	0.839	0.838	0.756	0.893	
28-Jul	0.848	0.786	0.776	0.801	0.858	0.852	0.775	0.905	
29-Jul	0.869	0.811	0.798	0.816	0.881	0.870	0.794	0.915	
30-Jul	0.892	0.837	0.821	0.826	0.915	0.882	0.821	0.920	
31-Jul	0.907	0.856	0.836	0.833	0.945	0.893	1.000	0.938	
01-Aug	0.921	0.878	0.847	1.000	1.000	1.000		0.960	
02-Aug	0.932	0.896	0.866					0.975	
03-Aug	0.943	0.914	0.886					0.985	
04-Aug	0.950	0.932	0.901					0.994	
05-Aug	0.958	0.944	0.918					0.996	
06-Aug	0.966	0.954	0.934					1.000	
07-Aug	0.975	0.961	0.949						
08-Aug	0.983	0.970	0.964						
09-Aug	0.989	0.980	0.973						
10-Aug	0.993	0.985	1.000						
11-Aug	0.997	0.989							
12-Aug	1.000	0.994							
13-Aug		0.998							
14-Aug		1.000							

a Proportion accrued on last day (1982-85) represents that portion of the escapement estimated after enumeration activities.

b Enumeration activities terminated on 16 July 1986. Estimated proportions from King and Tarbox (1988).

Table 15. Age composition of sockeye salmon in the Crescent River, 1979-87.

Year	Percent Composition by Age Class ^{a,b}								Sample Size
	1.1	1.2	1.3	1.4	2.1	2.2	2.3	Other	
1979	tr	27.8	70.1	0.0	0.0	tr	tr	tr	643
1980	0.0	6.5	86.9	0.0	0.0	2.9	1.6	2.1	511
1981	0.0	8.2	32.1	0.0	0.0	9.6	49.9	tr	1117
1982	0.0	12.9	79.2	0.1	0.0	0.8	7.0	0.0	711
1983	0.0	10.9	42.2	0.2	0.7	27.4	18.6	0.0	731
1984	0.0	3.5	16.9	0.0	0.0	20.0	59.4	tr	780
1985	0.2	4.7	31.3 (3.7)	0.0	0.3	20.5 (3.2)	43.0 (4.0)	0.0	594
1986	0.0	6.5	15.8 (6.1)	0.0	0.0	13.0 (5.6)	64.0 (8.0)	0.7	139
1987	0.0	2.6	47.7 (7.1)	0.0	0.0	4.2	45.0 (7.1)	0.5	191

^a Percentages weighted by total numbers in the escapement: 1979-81, 1986-87.

^b 95% confidence interval: +/- figures in parentheses.

Table 16. Salmon escapement observations in Susitna River tributaries, 1987.

	Method	Number of fish observed or estimated				
		Sockeye	Pink	Chum	Coho	Chinook
Alexander Creek ^a	weir					2,152
Answer Creek ^a	grnd count				10	
Birch Creek ^a	grnd count				46	
Cache Creek ^a	air count					556
Chulitna River ^a	air count					5,252
Deception Creek ^a	air count					692
Deshka River ^a	air count					15,028
Eightmile Creek ^b	air count	1,200				17
Goose Creek ^a	air count					416
Indian Creek ^a	air count					1,246
Lake Creek ^a	air count					4,898
Larson Lake ^b	weir	17,585				
Little Willow Creek ^a	air count					1,320
Montana Creek ^a	air count					1,320
N.Fork Kashwitna R. ^a	air count					872
Peters Creek ^a	air count					1,302
Portage Creek ^a	air count					2,616
Prairie Creek ^a	air count					9,138
Question Creek ^a	grnd count				149	
Sheep Creek ^a	air count					895
Shell Creek ^b	air count	1,515	17			
Talachulitna R.	air count	4,901	50			850
Trinity Creek ^b	air count	69				4
Willow Creek ^a	air count					2,768

^a Dave Watsjold, Alaska Department of Fish and Game, Division of Sport Fisheries, Anchorage, Alaska, personal communication.

^b Pat Marcuson, Cook Inlet Aquaculture Association, Soldotna, Alaska, personal communication.

Table 17. Cumulative proportion by date of sockeye salmon escapement in the Yentna River, 1981-87.

Date	Cumulative Proportion ^a						
	1981	1982	1983	1984	1985	1986	1987
27-Jun		0.000					
28-Jun		0.000					
29-Jun	0.001	0.000				0.001	
30-Jun	0.004	0.000	0.000			0.002	
01-Jul	0.008	0.001	0.001	0.001	0.000	0.002	0.000
02-Jul	0.013	0.001	0.001	0.001	0.001	0.003	0.001
03-Jul	0.016	0.001	0.002	0.002	0.001	0.003	0.001
04-Jul	0.017	0.002	0.003	0.003	0.001	0.004	0.002
05-Jul	0.018	0.002	0.003	0.004	0.001	0.005	0.002
06-Jul	0.020	0.002	0.004	0.004	0.002	0.005	0.003
07-Jul	0.021	0.002	0.004	0.005	0.003	0.006	0.003
08-Jul	0.023	0.002	0.004	0.005	0.003	0.006	0.004
09-Jul	0.026	0.002	0.005	0.006	0.004	0.007	0.004
10-Jul	0.056	0.002	0.005	0.007	0.005	0.008	0.005
11-Jul	0.092	0.003	0.006	0.009	0.006	0.009	0.005
12-Jul	0.155	0.003	0.008	0.011	0.007	0.010	0.005
13-Jul	0.230	0.003	0.011	0.012	0.008	0.011	0.006
14-Jul	0.344	0.003	0.034	0.015	0.009	0.011	0.007
15-Jul	0.454	0.004	0.059	0.017	0.010	0.014	0.008
16-Jul	0.521	0.005	0.096	0.023	0.010	0.022	0.010
17-Jul	0.563	0.016	0.131	0.142	0.011	0.027	0.014
18-Jul	0.599	0.043	0.179	0.232	0.012	0.036	0.020
19-Jul	0.638	0.155	0.351	0.345	0.013	0.041	0.027
20-Jul	0.681	0.329	0.567	0.458	0.014	0.042	0.034
21-Jul	0.732	0.527	0.693	0.554	0.014	0.043	0.047
22-Jul	0.801	0.627	0.722	0.626	0.016	0.052	0.059
23-Jul	0.846	0.665	0.758	0.681	0.019	0.162	0.107
24-Jul	0.882	0.711	0.786	0.755	0.145	0.193	0.218
25-Jul	0.905	0.734	0.824	0.785	0.359	0.253	0.331
26-Jul	0.925	0.780	0.867	0.808	0.507	0.371	0.442
27-Jul	0.940	0.811	0.894	0.836	0.636	0.491	0.528
28-Jul	0.950	0.831	0.905	0.855	0.782	0.606	0.587
29-Jul	0.958	0.847	0.913	0.866	0.903	0.752	0.625
30-Jul	0.969	0.859	0.921	0.874	0.942	0.831	0.655
31-Jul	0.976	0.890	0.925	0.885	0.960	0.861	0.686
01-Aug	0.980	0.933	0.929	0.893	0.970	0.882	0.709
02-Aug	0.986	0.948	0.937	0.901	0.978	0.908	0.750
03-Aug	0.988	0.955	0.941	0.909	0.983	0.917	0.789
04-Aug	0.990	0.962	0.945	0.920	0.987	0.924	0.825

- Continued -

Table 17. (p 2 of 2)

Date	Cumulative Proportion ^a						
	1981	1982	1983	1984	1985	1986	1987
05-Aug	0.991	0.965	0.949	0.926	0.990	0.935	0.857
06-Aug	0.992	0.967	0.953	0.934	0.994	0.940	0.875
07-Aug	0.992	0.970	0.955	0.939	0.997	1.000	0.889
08-Aug	0.992	0.972	0.958	0.944	1.000		0.900
09-Aug	0.993	0.975	0.959	0.949			0.932
10-Aug	0.994	0.977	0.959	0.954			0.962
11-Aug	0.995	0.979	0.962	0.958			0.986
12-Aug	0.996	0.981	0.968	0.962			0.996
13-Aug	0.997	0.982	0.974	0.965			1.000
14-Aug	0.997	0.984	0.977	0.968			
15-Aug	0.998	0.985	0.979	0.970			
16-Aug	0.998	0.986	0.982	0.973			
17-Aug	0.998	0.987	0.985	0.975			
18-Aug	0.998	0.988	0.987	0.977			
19-Aug	0.998	0.989	0.988	0.979			
20-Aug	0.999	0.990	0.990	0.980			
21-Aug	0.999	0.990	0.991	0.981			
22-Aug	0.999	0.990	0.992	0.984			
23-Aug	0.999	0.991	0.993	0.987			
24-Aug	1.000	0.992	0.994	0.989			
25-Aug	1.000	0.993	0.994	0.992			
26-Aug	1.000	0.994	0.995	0.994			
27-Aug	1.000	0.994	0.996	0.996			
28-Aug	1.000	0.995	0.997	0.996			
29-Aug	1.000	0.996	0.998	0.998			
30-Aug		0.997	0.998	0.999			
31-Aug		0.997	0.999	0.999			
01-Sep		0.998	0.999	1.000			
02-Sep		0.999	0.999	1.000			
03-Sep		0.999	0.999	1.000			
04-Sep		1.000	1.000	1.000			
05-Sep		1.000	1.000	1.000			

^a Proportion accrued on last day (1986) represents that portion of the escapement estimated after termination of enumeration activities.

Table 18. Age composition of sockeye salmon in the Yentna River, 1986-87.

Sample Period	Percent Composition by Age Class ^{a,b}										Sample Size
	0.2	0.3	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.3	
7/1-7/22/87	2.31	3.3	0.52	38.67	30.48	0.26		16.29	8.16		393
7/23-8/3/87	1.41	1.87		21.08	54.57	1.4		7.49	12.8		427
8/4-8/14/87	0.74	4.09	4.09	26.76	42.75			10.41	11.16		269
<hr/>											
Seasonal Summary											
1986	0.0	2.1	1.9	22.7 (3.7)	56.5 (4.4)	0.2	0.6	5.9	10.0 (2.7)	0.1	492
1987	1.3	2.4	0.9	23.3 (3.0)	50.6 (3.7)	1.0		8.6 (2.0)	11.7 (2.4)		1,089

^a Percentages weighted by total numbers in the escapement.

^b 95% confidence interval +/- figures in parentheses.

Table 19. Summary of chi-square analysis of temporal change in Yentna River sockeye salmon age composition, 1987.

Periods ^a	Number of Age Classes ^b	Calculated	Chi-square Value				Significant?	Hypothesis ^c
			Alpha	DF	Tabled Value			
1-3	3	50.95	0.05	4	9.49	yes	reject	
1-2	3	90.16	0.05	2	5.99	yes	reject	
2-3	3	91.14	0.05	2	5.99	yes	reject	

^a Period 1: 7/1-7/22.

Period 2: 7/23-8/3.

Period 3: 8/4-8/14.

^b Age classes: 1.2, 1.3, 2.2.

^c Hypothesis: Age class structure is independent of time of sampling.

Table 20. Cumulative proportion by date of pink salmon escapement in the Yentna River, 1981-87.

Date	Cumulative Proportion ^a						
	1981	1982	1983	1984	1985	1986	1987
27-Jun		0.000					
28-Jun		0.000					
29-Jun	0.000	0.000				0.000	0.000
30-Jun	0.002	0.000	0.000			0.000	0.000
01-Jul	0.003	0.000	0.001	0.000	0.001	0.000	0.002
02-Jul	0.005	0.000	0.001	0.000	0.002	0.000	0.004
03-Jul	0.007	0.000	0.001	0.000	0.003	0.000	0.008
04-Jul	0.008	0.000	0.002	0.000	0.003	0.000	0.011
05-Jul	0.008	0.000	0.003	0.000	0.005	0.001	0.015
06-Jul	0.011	0.000	0.003	0.000	0.007	0.001	0.018
07-Jul	0.015	0.000	0.003	0.000	0.011	0.001	0.022
08-Jul	0.021	0.000	0.003	0.000	0.012	0.001	0.025
09-Jul	0.025	0.000	0.004	0.000	0.015	0.001	0.029
10-Jul	0.037	0.000	0.004	0.000	0.018	0.001	0.031
11-Jul	0.039	0.000	0.005	0.001	0.021	0.001	0.035
12-Jul	0.039	0.000	0.006	0.001	0.025	0.001	0.041
13-Jul	0.042	0.000	0.009	0.001	0.030	0.001	0.047
14-Jul	0.050	0.000	0.030	0.001	0.033	0.002	0.051
15-Jul	0.057	0.000	0.039	0.001	0.038	0.003	0.056
16-Jul	0.061	0.000	0.056	0.001	0.042	0.007	0.065
17-Jul	0.062	0.001	0.098	0.003	0.046	0.011	0.075
18-Jul	0.072	0.002	0.171	0.008	0.050	0.014	0.088
19-Jul	0.082	0.010	0.288	0.023	0.053	0.015	0.099
20-Jul	0.105	0.021	0.400	0.067	0.056	0.016	0.110
21-Jul	0.132	0.040	0.511	0.126	0.060	0.017	0.135
22-Jul	0.158	0.056	0.565	0.190	0.064	0.021	0.156
23-Jul	0.236	0.078	0.638	0.277	0.078	0.059	0.180
24-Jul	0.311	0.126	0.704	0.365	0.135	0.125	0.222
25-Jul	0.398	0.162	0.743	0.420	0.226	0.222	0.307
26-Jul	0.464	0.192	0.791	0.466	0.329	0.369	0.407
27-Jul	0.512	0.237	0.820	0.510	0.475	0.535	0.537
28-Jul	0.580	0.330	0.843	0.578	0.636	0.695	0.624
29-Jul	0.639	0.447	0.855	0.669	0.763	0.830	0.668
30-Jul	0.705	0.562	0.864	0.728	0.833	0.894	0.701
31-Jul	0.752	0.654	0.871	0.784	0.877	0.924	0.729
01-Aug	0.795	0.735	0.879	0.837	0.903	0.957	0.741
02-Aug	0.819	0.824	0.903	0.873	0.926	0.979	0.767
03-Aug	0.834	0.896	0.908	0.903	0.942	0.991	0.799
04-Aug	0.849	0.934	0.912	0.925	0.956	0.996	0.838
05-Aug	0.865	0.953	0.918	0.943	0.966	0.999	0.870

- Continued -

Table 20. (p 2 of 2)

Date	Cumulative Proportion ^a						
	1981	1982	1983	1984	1985	1986	1987
06-Aug	0.883	0.962	0.924	0.956	0.978	1.000	0.887
07-Aug	0.897	0.969	0.931	0.962	0.991		0.895
08-Aug	0.905	0.978	0.936	0.969	1.000		0.901
09-Aug	0.913	0.984	0.937	0.975			0.921
10-Aug	0.918	0.989	0.938	0.982			0.950
11-Aug	0.924	0.991	0.943	0.986			0.975
12-Aug	0.929	0.994	0.951	0.988			0.989
13-Aug	0.930	0.996	0.958	0.991			0.996
14-Aug	0.931	0.997	0.966	0.992			1.000
15-Aug	0.935	0.998	0.971	0.994			
16-Aug	0.942	0.998	0.978	0.994			
17-Aug	0.949	0.999	0.984	0.995			
18-Aug	0.958	0.999	0.988	0.996			
19-Aug	0.967	0.999	0.990	0.997			
20-Aug	0.979	0.999	0.992	0.997			
21-Aug	0.984	0.999	0.993	0.997			
22-Aug	0.989	1.000	0.993	0.998			
23-Aug	0.992	1.000	0.994	0.998			
24-Aug	0.995	1.000	0.995	0.998			
25-Aug	0.997	1.000	0.996	0.999			
26-Aug	0.999	1.000	0.996	0.999			
27-Aug	1.000	1.000	0.997	0.999			
28-Aug	1.000	1.000	0.998	0.999			
29-Aug		1.000	0.998	0.999			
30-Aug		1.000	0.999	1.000			
31-Aug		1.000	0.999	1.000			
01-Sep		1.000	0.999	1.000			
02-Sep		1.000	0.999	1.000			
03-Sep		1.000	1.000	1.000			
04-Sep		1.000	1.000	1.000			
05-Sep		1.000	1.000	1.000			

^a Proportion accrued on last day (1986) represents that portion of the escapement estimated after termination of enumeration activities.

Table 21. Salmon escapement observations in selected Upper Cook Inlet anadromous streams, 1987.

Stream	Method	Number of fish observed or estimated ^a			
		Sockeye	Pink	Chum	Coho
Fitz Creek ^b	air count			550	
Clearwater Creek ^b	air count			7,350	
Chinitna River ^b	air count			150	
Silver Salmon Creek ^c	air count				1,500
Little Jack Sl. ^d	air count	1,248			
Big River ^d	air count	1,713			
Chilligan R. ^b	air count	5,000			
Bachatna Creek ^d	air count	456			
Drill Creek ^d	air count				1,200
Threemile Creek ^d	air count	30,000			
Theodore River ^e	air count				1,548
Lewis River ^e	air count				875
Little Susitna R. ^e	weir			4,865	
Fish Creek (Big Lake) ^f	weir	91,215		3,871	
Cottonwood Creek ^e	ground count			360	
Spring Creek ^e	ground count			110	
McRoberts Creek ^e	ground count			667	
Rabbit Creek ^e	ground count				27
Ship Creek ^e	ground count				1,030
Cambell Creek ^e	ground count				571
Canyon Creek ^g	ground count				12
Upper Granite Creek ^g	ground count				67
Bishop Creek ^d	air count	170			
Ninilchik River ^h	air count				600
Deep Creek ^h	air count				1,670
Anchor River ^h	weir		2,052		2,049
Packers Lake ^d	weir	35,401			4,350

^a Aerial and ground counts are not considered total escapement counts unless indicated.

^b ADF&G Commercial Fisheries Division surveys.

^c Nelson (1987).

^d Pat Marcuson, Cook Inlet Aquaculture Association, Soldotna, Alaska, personal communication.

^e Dave Watsjold, Alaska Department of Fish and Game, Division of Sport Fisheries, Anchorage, Alaska, personal communication.

^f Robert Chlupach, Alaska Department of Fish and Game, Division of Fisheries Rehabilitation, Enhancement and Development, Palmer, Alaska, personal communication.

^g Dan Logan, USDA, Forest Service, Seward, Alaska, personal communication.

^h Larson and Balland (1988).

Table 22. Cumulative proportion by date of sockeye salmon escapement into Fish Creek (Big Lake), 1980-87.

Date	Cumulative Proportion							
	1980	1981	1982	1983	1984	1985	1986	1987
29-Jun					0.001			
30-Jun					0.001			
01-Jul					0.001			
02-Jul					0.001			
03-Jul					0.001			
04-Jul	0.000				0.001			
05-Jul	0.001			0.000	0.001			
06-Jul	0.001			0.000	0.001		0.000	
07-Jul	0.001			0.000	0.001		0.000	
08-Jul	0.002			0.000	0.001	0.000		0.000
09-Jul	0.002	0.008		0.000	0.001	0.000		0.000
10-Jul	0.003	0.012		0.000	0.001	0.000		0.004
11-Jul	0.003	0.059		0.000	0.004	0.002		0.004
12-Jul	0.003	0.128	0.000	0.000	0.006	0.002		0.005
13-Jul	0.003	0.164	0.000	0.000	0.013	0.003		0.006
14-Jul	0.004	0.271	0.001	0.002	0.023	0.004		0.006
15-Jul	0.004	0.413	0.001	0.004	0.030	0.005	0.000	0.010
16-Jul	0.004	0.521	0.001	0.008	0.032	0.007	0.001	0.018
17-Jul	0.005	0.578	0.001	0.010	0.032	0.008	0.004	0.034
18-Jul	0.064	0.638	0.002	0.011	0.078	0.008	0.005	0.040
19-Jul	0.135	0.708	0.013	0.023	0.128	0.008	0.010	0.059
20-Jul	0.175	0.754	0.065	0.042	0.186	0.008	0.017	0.096
21-Jul	0.287	0.787	0.131	0.138	0.211	0.010	0.035	0.170
22-Jul	0.397	0.825	0.246	0.299	0.279	0.025	0.044	0.197
23-Jul	0.524	0.834	0.305	0.390	0.338	0.043	0.081	0.249
24-Jul	0.679	0.851	0.439	0.460	0.422	0.063	0.110	0.377
25-Jul	0.802	0.874	0.517	0.551	0.565	0.082	0.142	0.497
26-Jul	0.846	0.899	0.590	0.607	0.622	0.112	0.169	0.574
27-Jul	0.864	0.902	0.649	0.676	0.698	0.133	0.172	0.644
28-Jul	0.911	0.933	0.724	0.720	0.745	0.242	0.205	0.672
29-Jul	0.919	0.937	0.784	0.762	0.762	0.365	0.237	0.681
30-Jul	0.927	0.969	0.854	0.792	0.765	0.422	0.394	0.705
31-Jul	0.943	0.977	0.858	0.804	0.799	0.500	0.513	0.767
01-Aug	0.953	0.984	0.861	0.828	0.833	0.546	0.577	0.811
02-Aug	0.961	0.986	0.880	0.864	0.859	0.584	0.632	0.821
03-Aug	0.971	0.988	0.891	0.871	0.871	0.659	0.665	0.862
04-Aug	0.982	0.990	0.892	0.913	0.878	0.703	0.768	0.894
05-Aug	0.985	0.991	0.896	0.939	0.880	0.739	0.817	0.914
06-Aug	0.988	0.991	0.896	0.942	0.889	0.771	0.858	0.942
07-Aug	0.990	0.993	0.897	0.949	0.900	0.911	0.905	0.957

- Continued -

Table 22. (p. 2 of 2)

Date	Cumulative Proportion							
	1980	1981	1982	1983	1984	1985	1986	1987
08-Aug	0.992	0.993	0.903	0.950	0.927	0.921	0.949	0.973
09-Aug	0.993	0.997	0.905	0.966	0.934	0.921	0.970	0.982
10-Aug	0.995	0.998	0.907	0.973	0.936	0.922	0.971	0.993
11-Aug	0.995	0.998	0.917	0.979	0.940	0.935	0.998	1.000
12-Aug	0.996	0.999	0.921	0.979	0.940	0.943	1.000	
13-Aug	0.997	0.999	0.924	0.981	0.945	0.968		
14-Aug	0.998	0.999	0.928	0.984	0.948	0.986		
15-Aug	0.998	0.999	0.932	0.984	0.955	0.992		
16-Aug	0.999	1.000	0.934	0.987	0.958	0.992		
17-Aug	0.999	1.000	0.939	0.990	0.959	0.995		
18-Aug	0.999	1.000	0.952	0.991	0.960	0.996		
19-Aug	1.000	1.000	0.958	0.993	0.963	0.998		
20-Aug	1.000	1.000	0.961	0.993	0.964	0.998		
21-Aug	1.000	1.000	0.962	0.994	0.970	0.999		
22-Aug	1.000	1.000	0.963	0.994	0.971	0.999		
23-Aug	1.000		0.964	0.996	0.972	0.999		
24-Aug	1.000		0.965	0.997	0.982	1.000		
25-Aug	1.000		0.966	0.998	0.991	1.000		
26-Aug	1.000		0.970	0.998	0.994	1.000		
27-Aug	1.000		0.971	0.999	0.995	1.000		
28-Aug			0.973	1.000	0.995	1.000		
29-Aug			0.975	1.000	0.995	1.000		
30-Aug			0.976	1.000	0.996			
31-Aug			0.979		0.996			
01-Sep			0.981		0.997			
02-Sep			0.982		0.998			
03-Sep			0.985		0.998			
04-Sep			0.986		0.998			
05-Sep			0.987		0.999			
06-Sep			0.987		0.999			
07-Sep			0.988		0.999			
08-Sep			0.989		0.999			
09-Sep			1.000		1.000			
10-Sep					1.000			
11-Sep					1.000			
12-Sep					1.000			
13-Sep					1.000			
14-Sep					1.000			
15-Sep					1.000			
16-Sep					1.000			
17-Sep					1.000			
18-Sep					1.000			
19-Sep					1.000			

Table 23. Age composition of sockeye salmon in Fish Creek (Big Lake), 1986-87.

Year	Percent Composition by Age Class ^a										Sample Size
	0.2	0.3	1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.3	
1986	0.0	0.0	12.9 (1.9)	54.2 (2.7)	18.4 (1.4)	0.2	2.9	10.2 (2.0)	1.2	0.0	1,306
1987			4.2	87.2	2.9 (2.8)			5.8			547

^a 95% confidence interval +/- figures in parentheses.

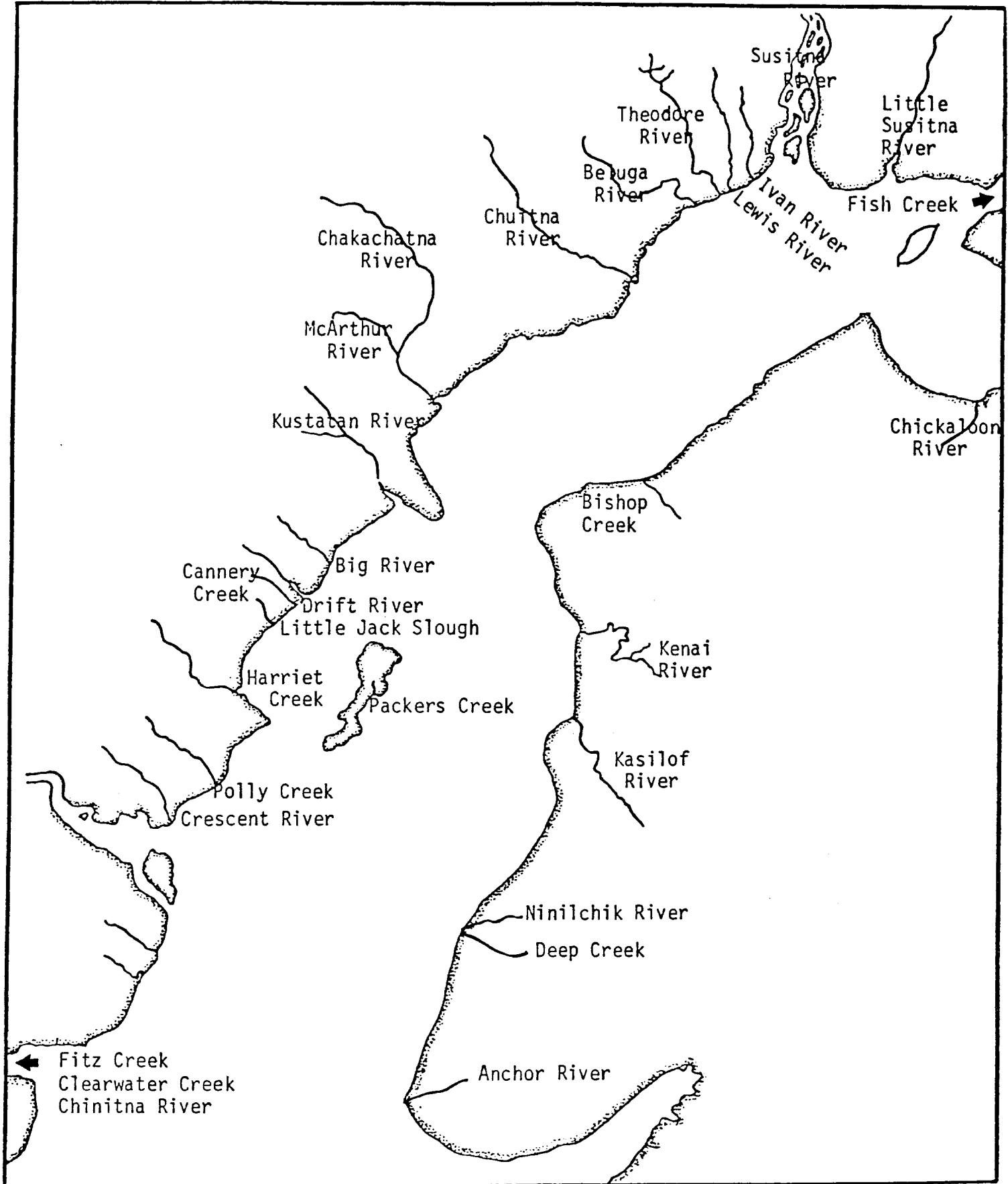


Figure 1. Anadromous streams of Upper Cook Inlet, Alaska.

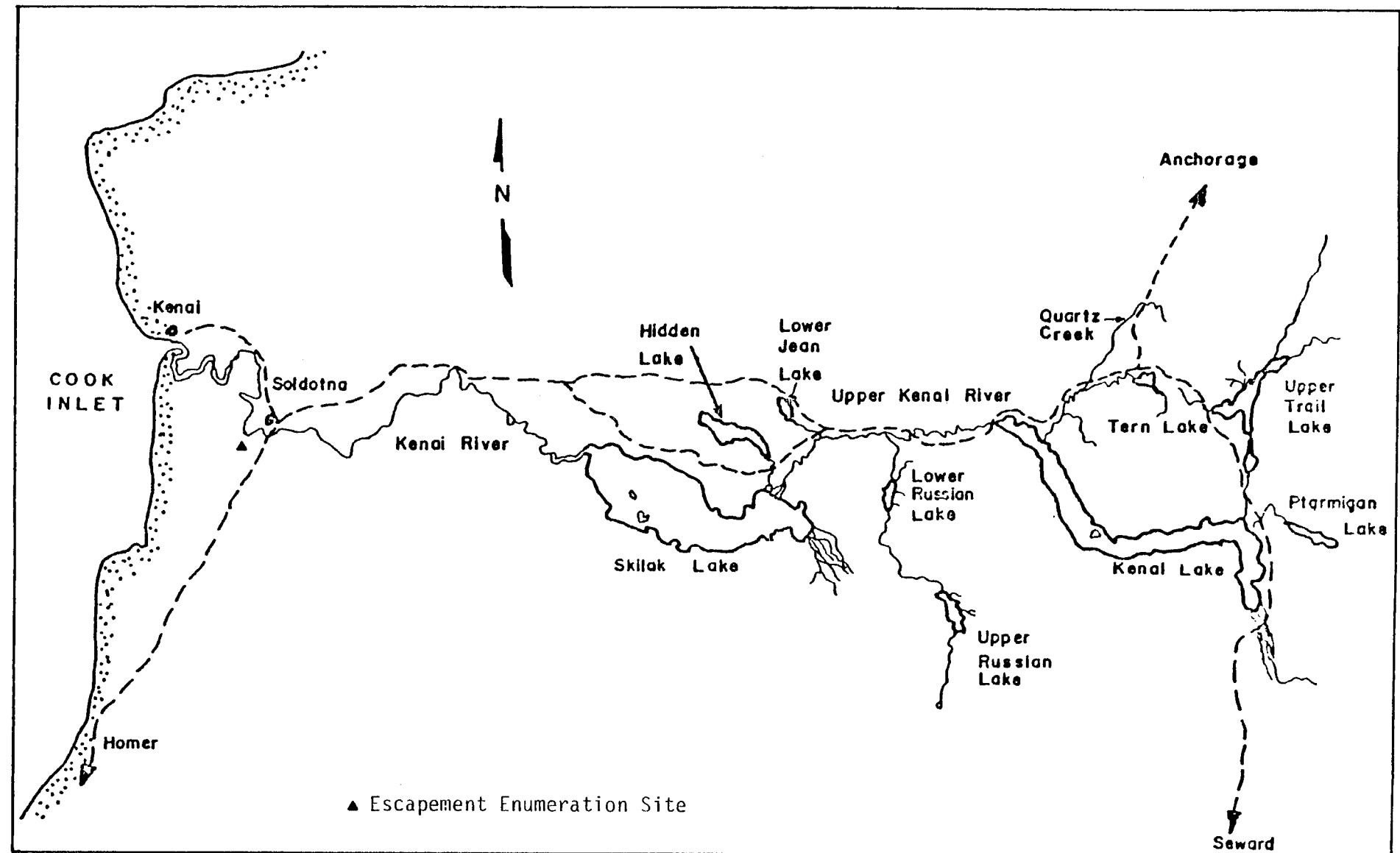


Figure 2. Kenai River drainage and major sockeye salmon rearing lakes.

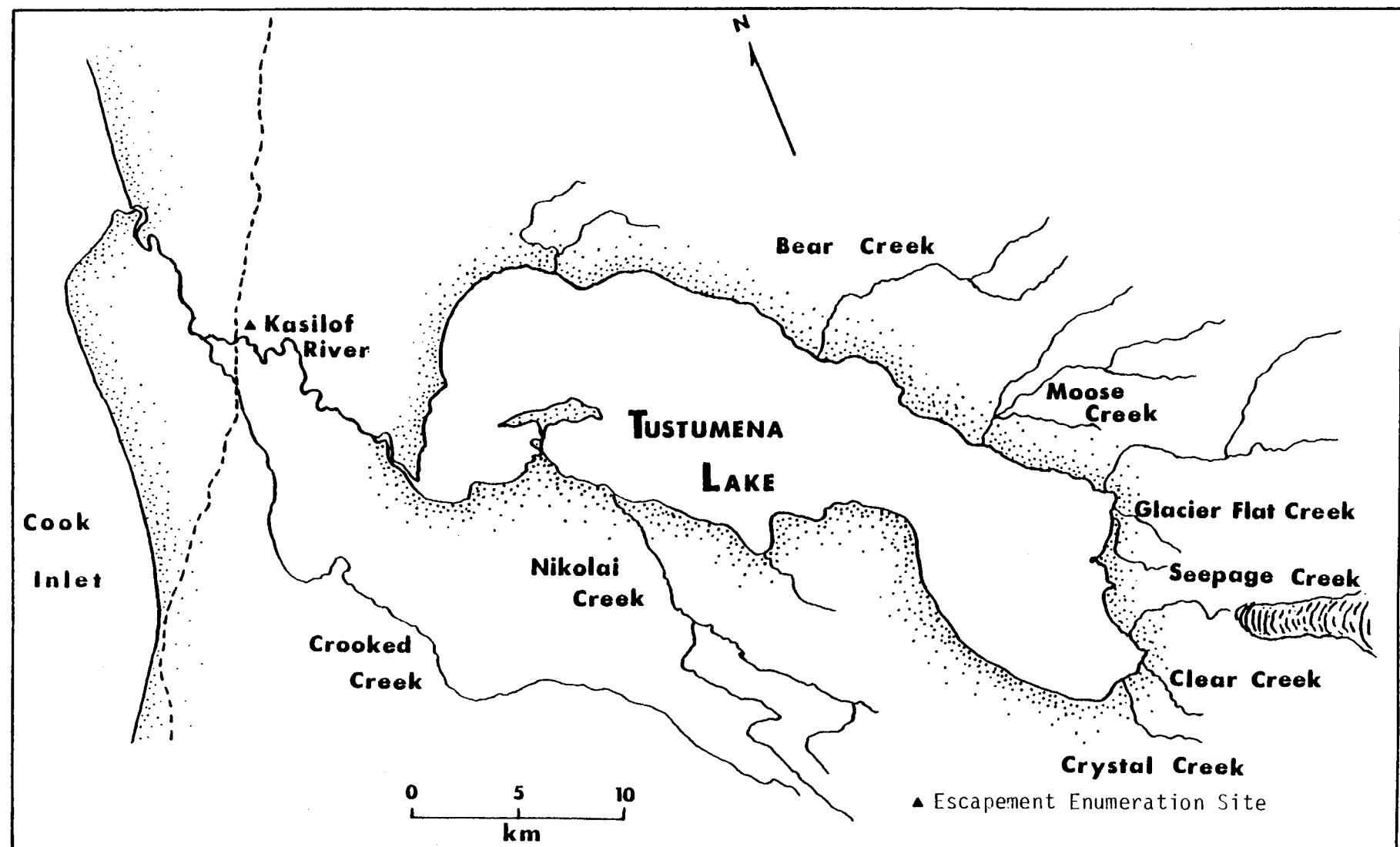


Figure 3. Kasilof River drainage and major sockeye salmon spawning tributaries.

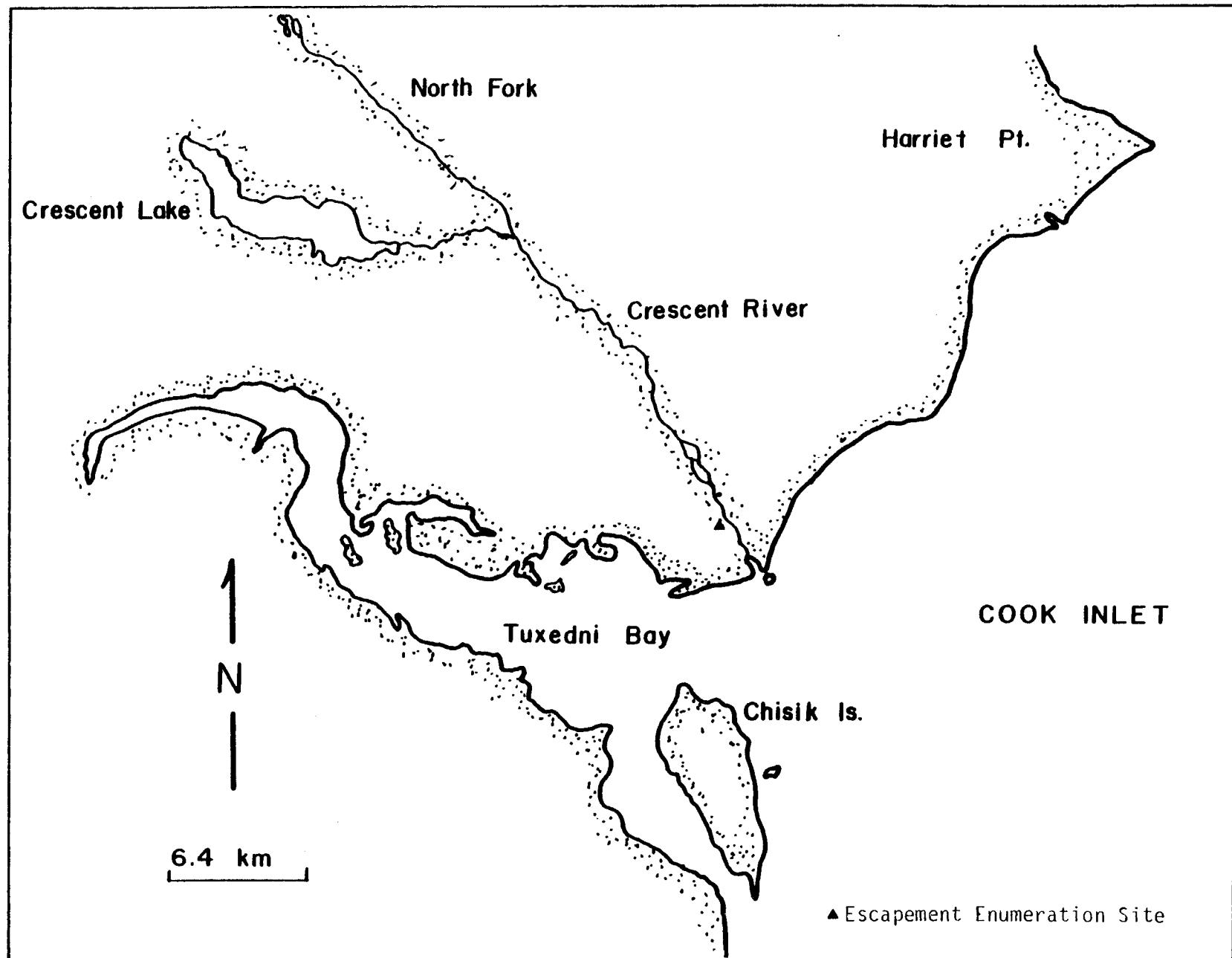


Figure 4. Crescent River drainage and major sockeye salmon rearing lakes.

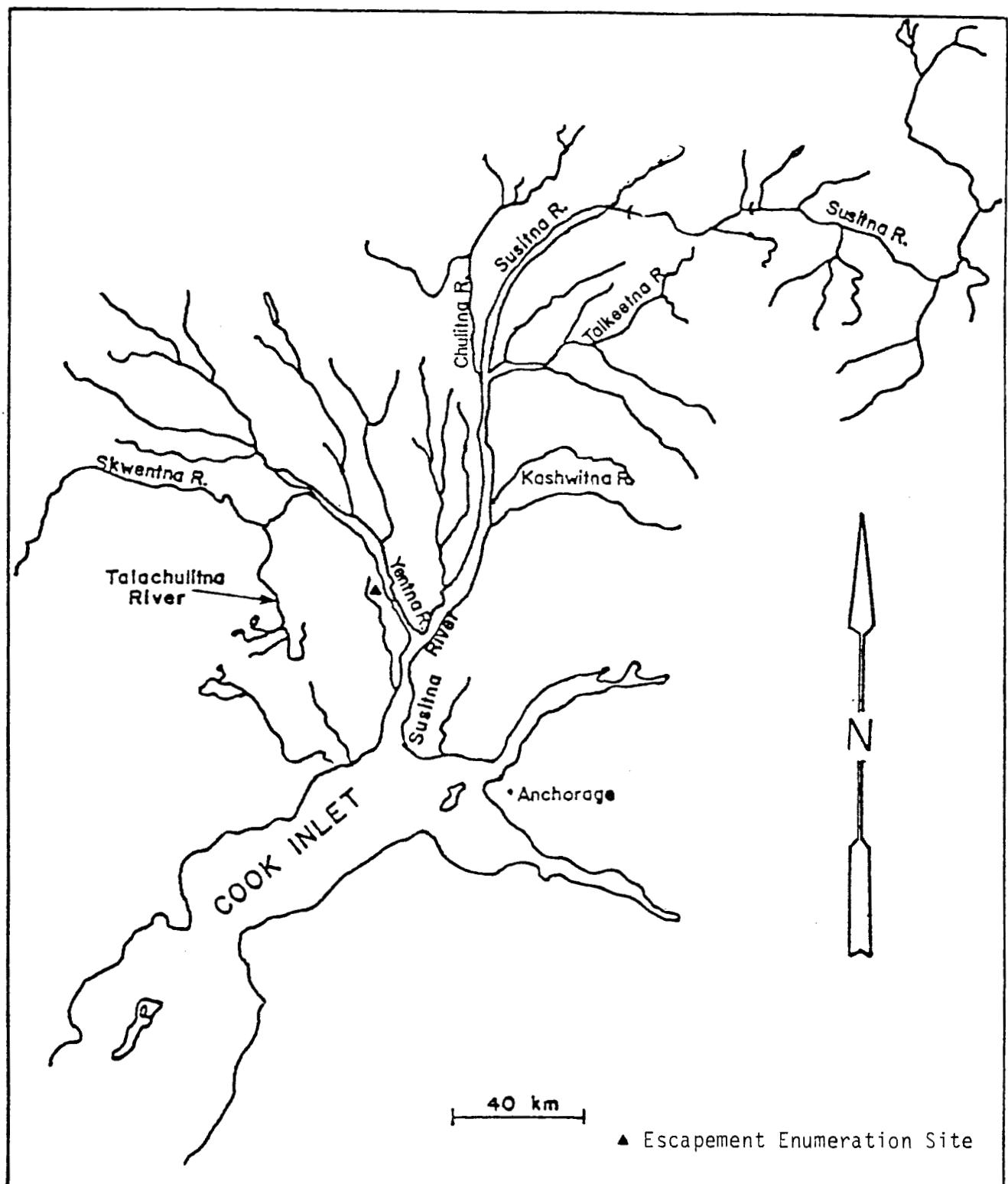


Figure 5. Susitna River and major tributaries.

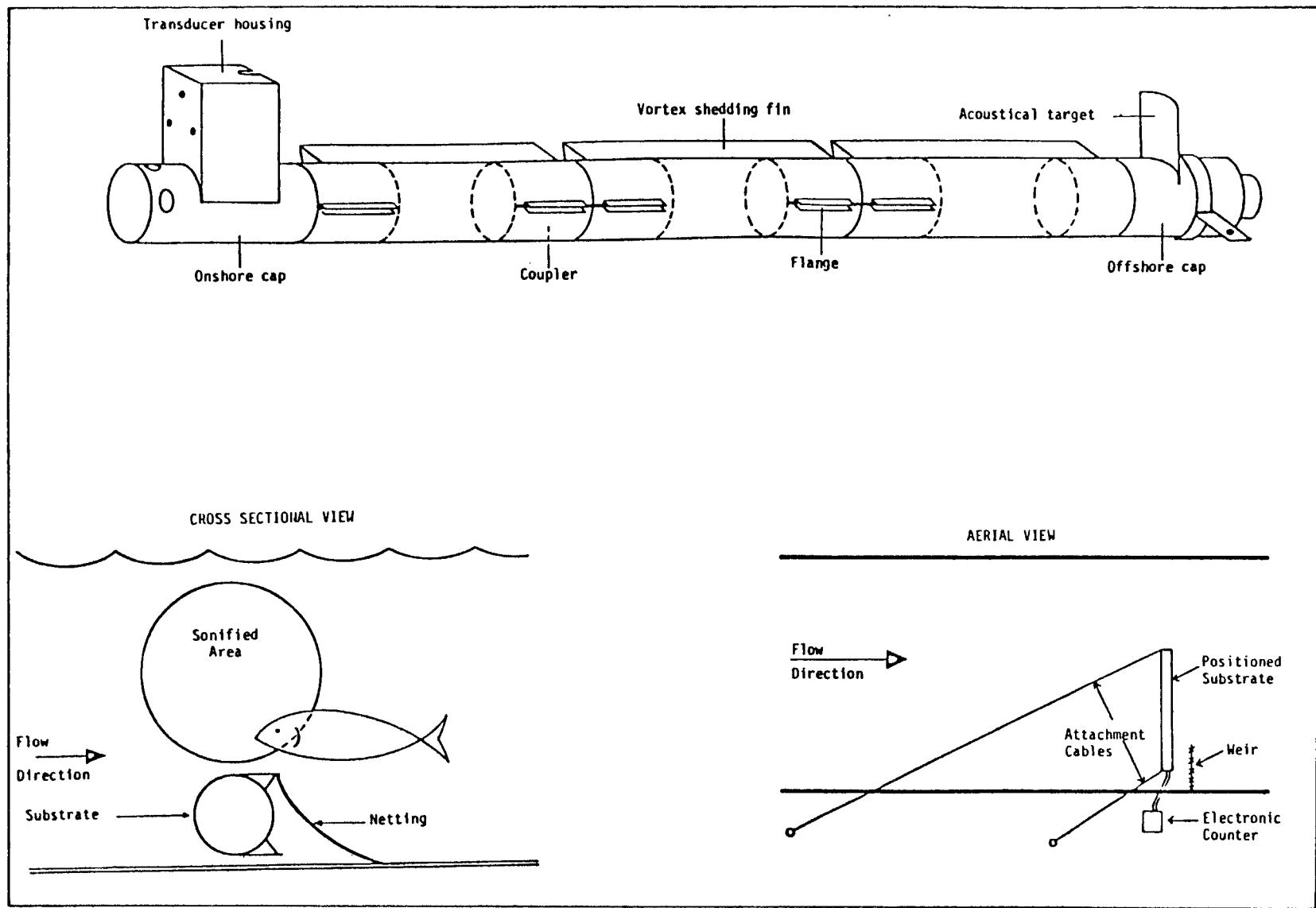


Figure 6. Side scan sonar system used to count salmon in Upper Cook Inlet, Alaska.

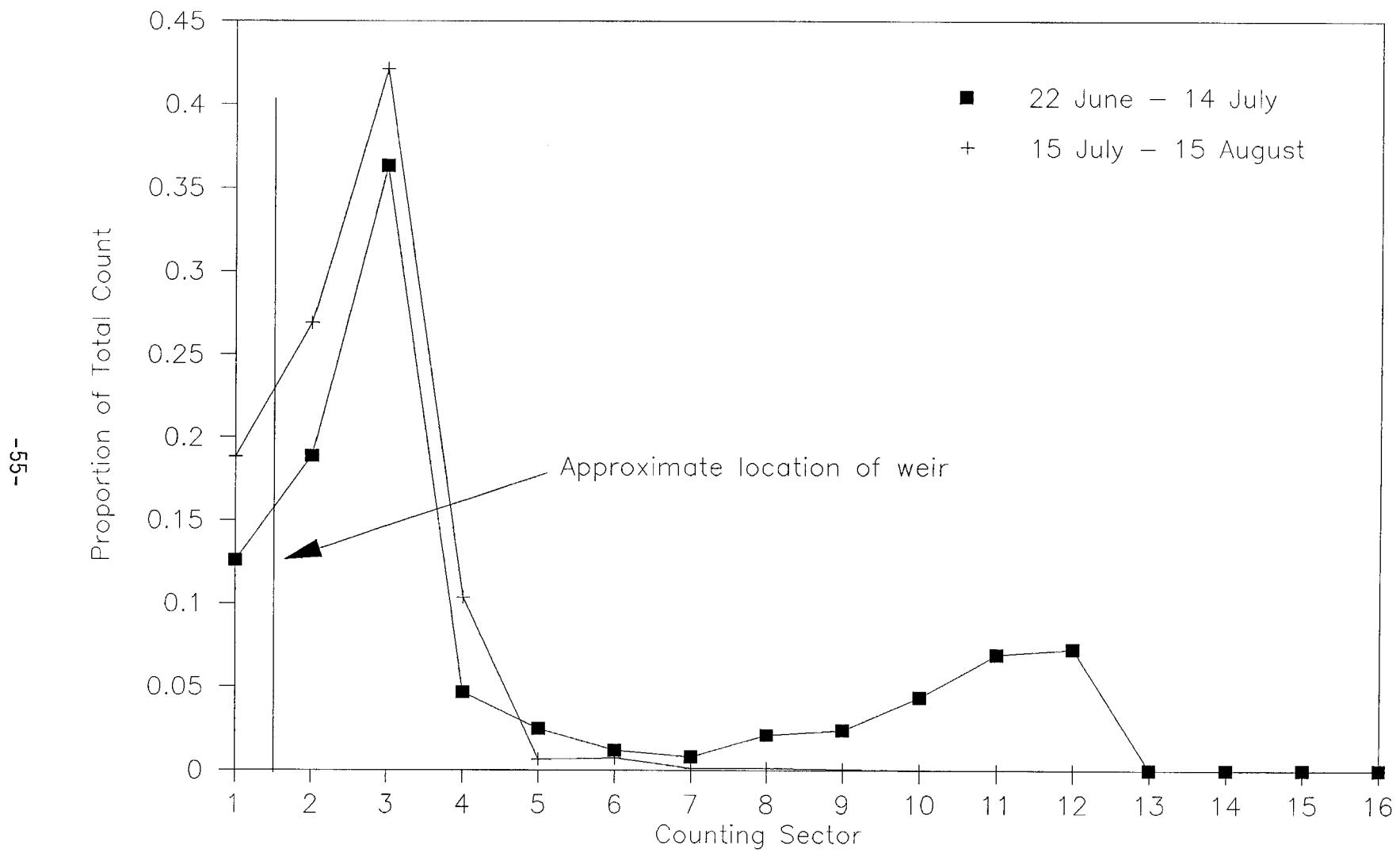


Figure 7. Distribution from shore of fish on the north bank of the Kenai River, 22 June through 15 August 1987.

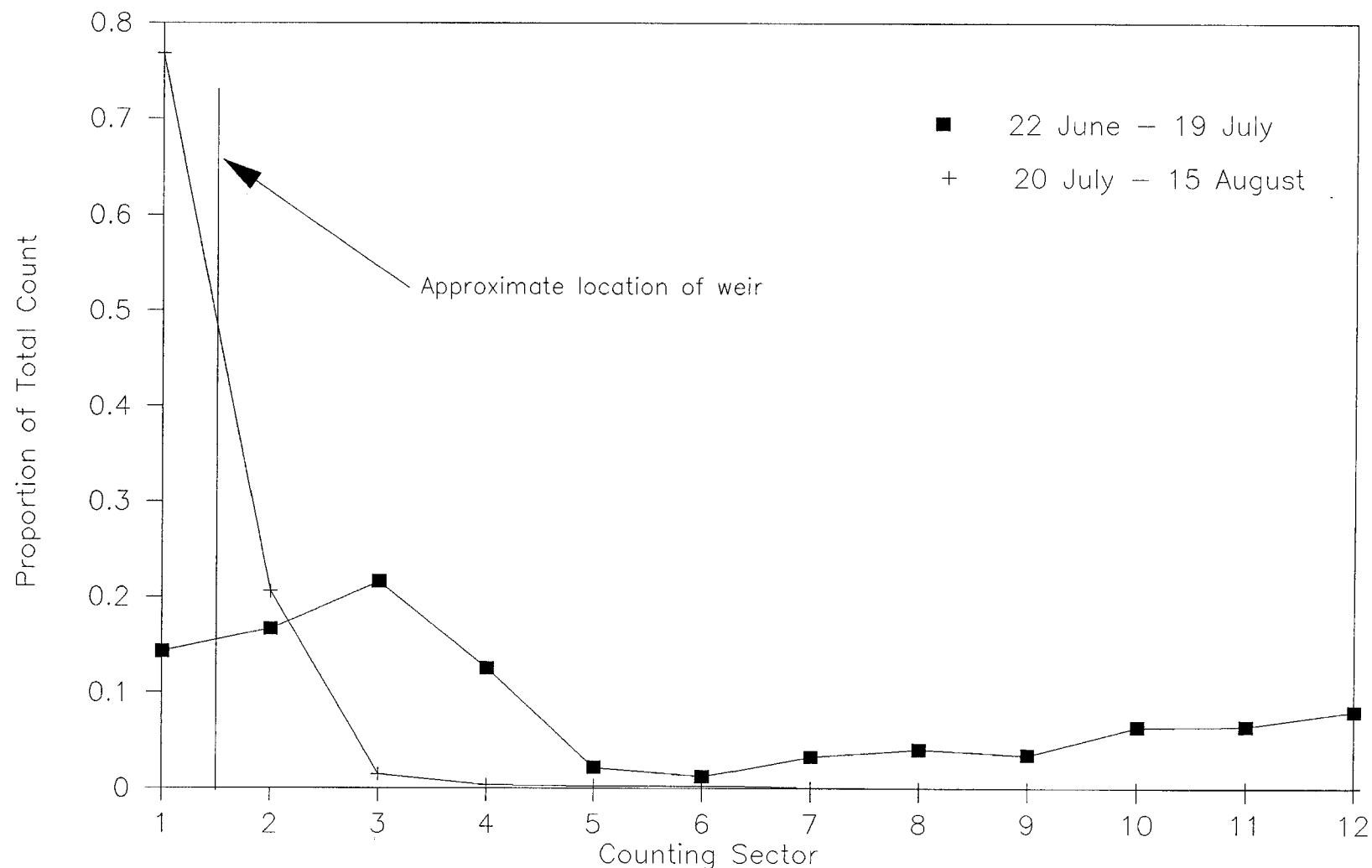


Figure 8. Distribution from shore of fish on the south bank of the Kenai River, 22 June through 15 August 1987.

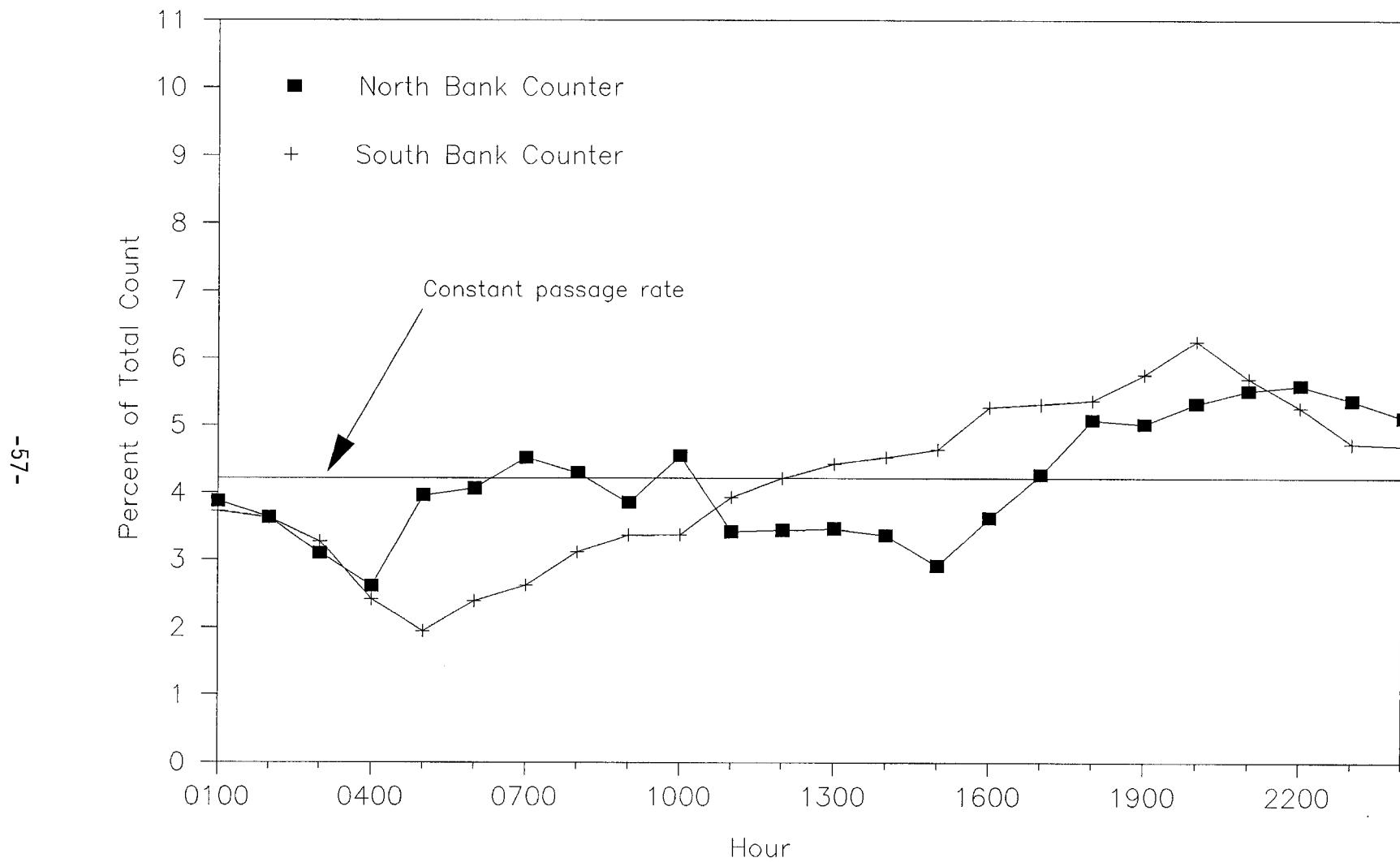


Figure 9. Hourly distribution of fish migrating past the Kenai River sonar counters, 1987.

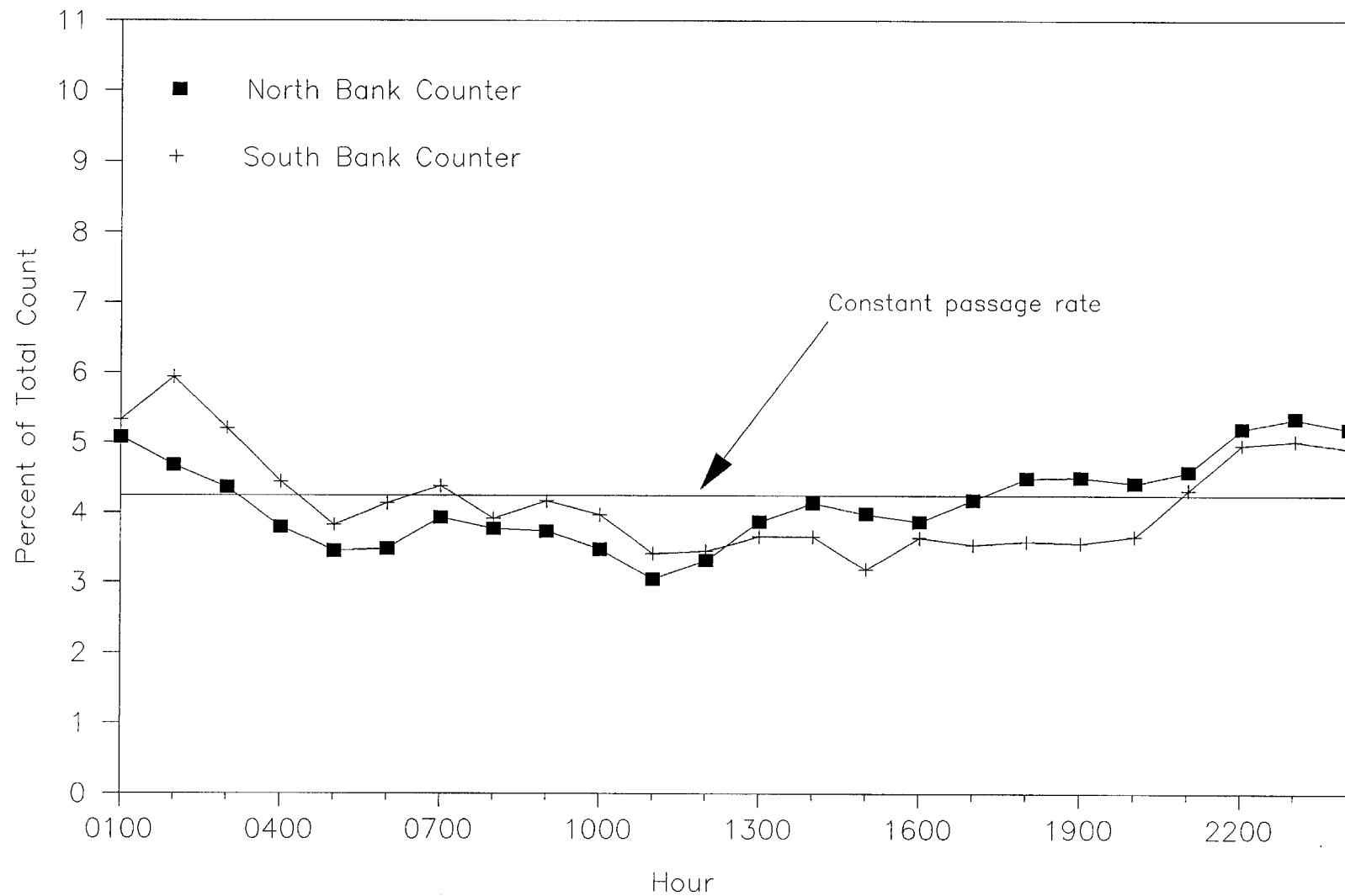


Figure 10. Hourly distribution of fish migrating past the Kasilof River sonar counters, 1987.

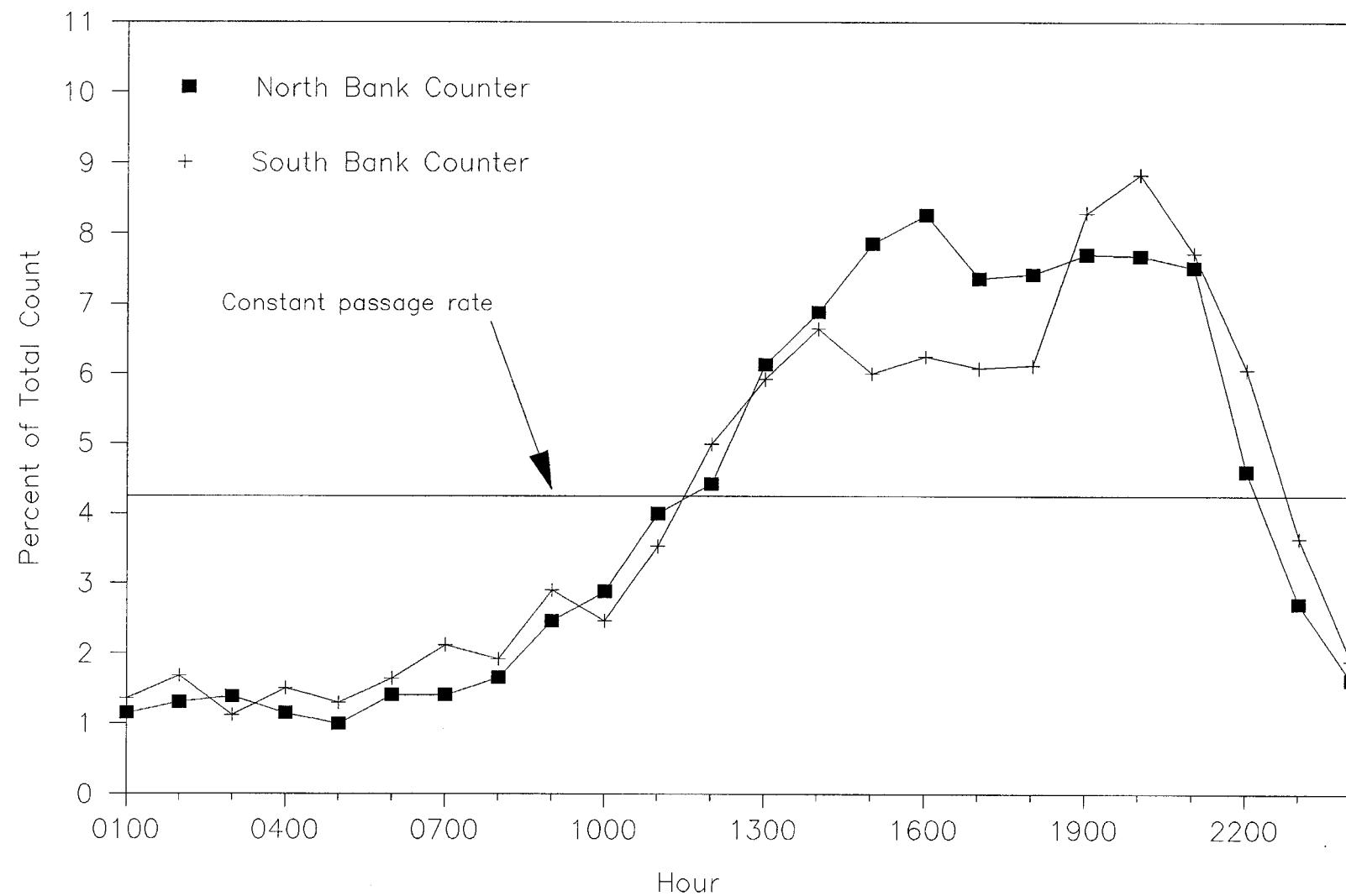


Figure 11. Hourly distribution of fish migrating past the Crescent River sonar counters, 1987.

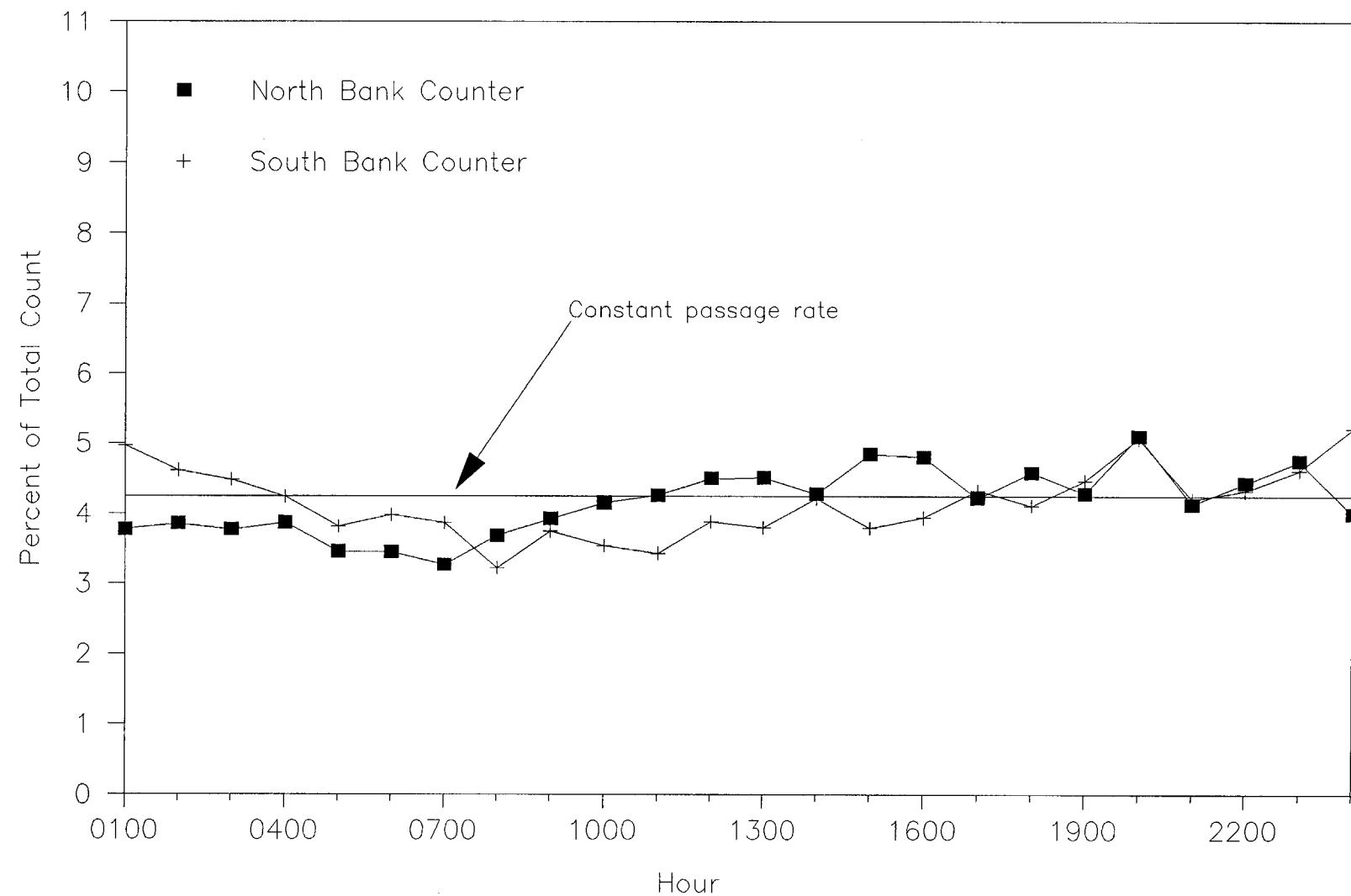


Figure 12. Hourly distribution of fish migrating past the Yentna River sonar counters, 1987.

APPENDICES

Appendix A.1. Estimated salmon escapement into the Kenai River, north and south banks combined, 22 June through 15 August, 1987. Daily fish targets apportioned to species by fish wheel catch.

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
22-Jun	1,553	1,553	35	35	0	0	0	0
23-Jun	1,041	2,594	24	59	0	0	0	0
24-Jun	658	3,252	15	74	0	0	0	0
25-Jun	702	3,955	16	89	0	0	0	0
26-Jun	1,128	5,083	26	115	0	0	0	0
27-Jun	1,521	6,604	34	149	0	0	0	0
28-Jun	1,763	8,367	40	189	0	0	0	0
29-Jun	1,374	9,741	31	220	0	0	0	0
30-Jun	1,318	11,059	30	250	0	0	0	0
01-Jul	710	11,769	16	266	0	0	0	0
02-Jul	577	12,346	13	279	0	0	0	0
03-Jul	450	12,796	10	289	0	0	0	0
04-Jul	550	13,345	12	302	0	0	0	0
05-Jul	585	13,930	13	315	0	0	0	0
06-Jul	474	14,404	11	326	0	0	0	0
07-Jul	618	15,022	14	340	0	0	0	0
08-Jul	489	15,511	11	351	0	0	0	0
09-Jul	404	15,915	9	360	0	0	0	0
10-Jul	411	16,326	9	369	0	0	0	0
11-Jul	382	16,708	9	378	0	0	0	0
12-Jul	1,001	17,709	23	401	0	0	0	0
13-Jul	5,504	23,214	125	525	0	0	0	0
14-Jul	4,700	27,913	106	632	0	0	0	0
15-Jul	24,190	52,103	547	1,179	0	0	0	0
16-Jul	16,936	69,039	383	1,562	0	0	0	0
17-Jul	14,026	83,065	204	1,766	0	0	136	136
18-Jul	9,362	92,426	136	1,903	0	0	91	227
19-Jul	18,341	110,767	0	1,903	0	0	0	227
20-Jul	113,852	224,619	0	1,903	0	0	0	227
21-Jul	150,293	374,912	368	2,271	0	0	322	549
22-Jul	134,519	509,431	792	3,063	0	0	0	549
23-Jul	138,255	647,686	0	3,063	0	0	0	549
24-Jul	132,238	779,924	0	3,063	0	0	0	549
25-Jul	130,564	910,488	0	3,063	0	0	0	549
26-Jul	111,678	1,022,166	0	3,063	0	0	0	549
27-Jul	85,986	1,108,152	224	3,286	0	0	461	1,010
28-Jul	73,679	1,181,832	0	3,286	0	0	1,332	2,341
29-Jul	42,109	1,223,940	0	3,286	191	191	0	2,341
30-Jul	37,757	1,261,697	0	3,286	0	191	0	2,341

- Continued -

Appendix A.1. (p 2 of 2)

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
31-Jul	65,875	1,327,572	0	3,286	0	191	0	2,341
01-Aug	62,906	1,390,478	0	3,286	0	191	0	2,341
02-Aug	44,765	1,435,243	0	3,286	313	504	0	2,341
03-Aug	29,070	1,464,313	0	3,286	293	797	146	2,488
04-Aug	21,320	1,485,633	0	3,286	0	797	0	2,488
05-Aug	20,194	1,505,827	33	3,319	459	1,256	115	2,602
06-Aug	15,529	1,521,356	0	3,319	368	1,624	368	2,970
07-Aug	14,127	1,535,483	0	3,319	201	1,825	0	2,970
08-Aug	7,976	1,543,460	53	3,372	351	2,175	47	3,017
09-Aug	8,872	1,552,332	36	3,408	267	2,443	45	3,062
10-Aug	11,277	1,563,608	0	3,408	607	3,050	0	3,062
11-Aug	8,651	1,572,259	0	3,408	888	3,938	0	3,062
12-Aug	6,171	1,578,430	0	3,408	467	4,405	0	3,062
13-Aug	3,779	1,582,209	0	3,408	602	5,008	41	3,103
14-Aug	10,895	1,593,103	0	3,408	3,102	8,110	0	3,103
15-Aug	3,766	1,596,870	75	3,483	955	9,065	55	3,157

Appendix A.2. Kenai River north bank sonar counts by sector, 22 June through 15 August, 1987.

Date	Count by Sector																Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
22-Jun	0	1	2	1	5	6	20	0	0	0	0	0	0	0	0	0	35
23-Jun	37	39	4	7	7	7	37	21	17	26	1	0	0	0	0	0	203
24-Jun	1	0	7	3	0	0	1	22	2	0	3	1	0	0	0	0	40
25-Jun	2	0	0	8	16	26	0	0	0	0	0	0	0	0	0	0	52
26-Jun	39	6	7	11	23	37	0	2	0	0	6	30	0	0	0	0	161
Total	79	46	20	30	51	76	58	45	19	26	10	31	0	0	0	0	491
Percent	16.1	9.4	4.1	6.1	10.4	15.5	11.8	9.2	3.9	5.3	2.0	6.3	0.0	0.0	0.0	0.0	100.0
27-Jun	468	183	50	3	0	1	3	1	9	21	24	62	0	0	0	0	825
28-Jun	568	217	72	8	0	0	6	9	3	39	29	99	0	0	0	0	1050
29-Jun	127	96	54	14	25	5	0	11	11	52	53	77	0	0	0	0	525
30-Jun	19	65	66	68	58	5	7	25	9	6	19	22	0	0	0	0	369
01-Jul	11	22	26	94	57	40	5	18	25	41	32	38	0	0	0	0	409
Total	1193	583	268	187	140	51	21	64	57	159	157	298	0	0	0	0	3178
Percent	37.5	18.3	8.4	5.9	4.4	1.6	0.7	2.0	1.8	5.0	4.9	9.4	0.0	0.0	0.0	0.0	100.0
02-Jul	4	8	15	5	1	0	0	1	1	8	37	24	0	0	0	0	104
03-Jul	0	1	2	1	0	0	0	2	1	10	37	25	0	0	0	0	79
04-Jul	5	10	18	3	0	1	0	5	9	41	92	80	0	0	0	0	264
05-Jul	8	6	14	3	0	0	0	7	29	52	81	70	0	0	0	0	270
06-Jul	4	4	17	4	1	2	0	11	15	23	93	79	0	0	0	0	253
Total	21	29	66	16	2	3	0	26	55	134	340	278	0	0	0	0	970
Percent	2.2	3.0	6.8	1.6	0.2	0.3	0.0	2.7	5.7	13.8	35.1	28.7	0.0	0.0	0.0	0.0	100.0
07-Jul	9	14	13	4	0	0	0	23	15	37	102	91	0	0	0	0	308
08-Jul	10	11	14	1	0	0	0	16	16	35	48	41	0	0	0	0	192
09-Jul	10	26	8	10	8	0	0	30	12	35	21	12	0	0	0	0	172
10-Jul	16	19	19	2	0	0	1	18	7	22	53	33	0	0	0	0	190
11-Jul	11	27	25	4	1	0	0	0	1	2	6	0	0	0	0	0	77
Total	56	97	79	21	9	0	1	87	51	131	230	177	0	0	0	0	939
Percent	6.0	10.3	8.4	2.2	1.0	0.0	0.1	9.3	5.4	14.0	24.5	18.8	0.0	0.0	0.0	0.0	100.0

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Appendix A.2. (p. 2 of 3)

Date	Count by Sector																Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
12-Jul	15	851	2080	43	7	3	11	14	54	6	13	7	0	0	0	0	3104
13-Jul	6	11	22	10	0	0	0	1	34	34	28	26	0	0	0	0	172
14-Jul	45	507	1551	216	69	2	0	0	0	0	0	0	0	0	0	0	2390
15-Jul	384	8806	7432	1221	74	212	14	19	0	0	0	0	0	0	0	0	18162
16-Jul	12580	5578	5205	1364	184	305	25	19	20	4	0	0	0	0	0	0	25284
Total	13030	15753	16290	2854	334	522	50	53	108	44	41	33	0	0	0	0	49112
Percent	26.5	32.1	33.2	5.8	0.7	1.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	100.0
17-Jul	961	1848	858	819	307	234	33	10	38	6	0	0	0	0	0	0	5114
18-Jul	964	2887	7159	2684	255	109	12	4	0	0	0	0	0	0	0	0	14074
19-Jul	5559	3164	4899	853	63	7	121	226	0	0	0	0	0	0	0	0	14892
20-Jul	1935	18333	34805	8926	484	3594	218	200	133	0	0	0	55	55	55	55	68848
21-Jul	2337	25928	46760	11958	306	148	232	0	77	3	24	0	0	0	0	0	87773
Total	11756	52160	94481	25240	1415	4092	616	440	248	9	24	0	55	55	55	55	190701
Percent	6.2	27.4	49.5	13.2	0.7	2.1	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
22-Jul	4803	16872	34179	7916	243	114	50	0	0	0	0	0	0	0	0	0	64177
23-Jul	5494	20403	31248	7695	541	35	2	19	13	0	0	0	0	0	0	0	65450
24-Jul	10454	17791	28448	5088	287	38	3	8	33	14	0	0	0	0	0	0	62164
25-Jul	7084	18103	31834	5777	328	16	10	14	1	0	0	0	0	0	0	0	63167
26-Jul	13826	14903	26160	6054	266	36	0	20	9	9	0	0	0	0	0	0	61283
Total	41661	88072	151869	32530	1665	239	65	61	56	23	0	0	0	0	0	0	316241
Percent	13.2	27.8	48.0	10.3	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
27-Jul	12484	7461	14689	5781	336	93	9	120	11	1	0	1	1	1	1	1	40987
28-Jul	9070	4732	11866	4793	313	76	11	0	4	0	0	0	0	0	0	0	30865
29-Jul	5559	3164	4899	853	63	7	121	226	0	0	0	0	0	0	0	0	14892
30-Jul	8311	2074	4311	1041	132	90	10	1	0	0	0	0	0	0	0	0	15970
31-Jul	11346	1552	3687	1641	189	54	22	2	1	0	0	0	0	0	0	0	18494
Total	46770	18983	39452	14109	1083	320	173	349	16	1	0	1	1	1	0	0	121208
Percent	38.6	15.7	32.5	11.6	0.9	0.3	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0

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Appendix A.2. (p. 3 of 3)

Date	Count by Sector																Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
01-Aug	6457	3214	7564	2103	29	14	6	0	0	0	0	0	0	0	0	0	19387
02-Aug	17018	2533	6796	2002	97	58	11	0	0	0	0	0	0	0	0	0	28515
03-Aug	3275	2811	5353	1357	0	0	13	13	55	24	0	0	0	0	0	0	12901
04-Aug	1820	2368	2239	547	0	0	0	0	126	25	0	0	0	0	0	0	7125
05-Aug	1855	1979	1634	404	11	12	0	9	0	0	0	0	0	0	0	0	5904
Total	30425	12905	23586	6413	137	84	30	22	181	49	0	0	0	0	0	0	73832
Percent	41.2	17.5	31.9	8.7	0.2	0.1	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
06-Aug	640	2221	986	141	118	128	0	0	0	0	0	0	0	0	0	0	4234
07-Aug	626	4338	1683	123	37	43	0	0	2	0	0	0	0	0	0	0	6852
08-Aug	377	2274	948	93	114	71	0	0	0	0	0	0	0	0	0	0	3877
09-Aug	512	2798	1371	112	55	73	0	0	0	0	0	0	0	0	0	0	4921
10-Aug	572	3755	1224	68	73	65	0	0	1	0	0	0	0	0	0	0	5758
Total	2727	15386	6212	537	397	380	0	0	3	0	0	0	0	0	0	0	25642
Percent	10.6	60.0	24.2	2.1	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
11-Aug	532	2528	693	57	46	22	0	0	0	0	0	0	0	0	0	0	3878
12-Aug	645	2233	451	35	29	12	0	0	0	0	0	0	0	0	0	0	3405
13-Aug	426	1330	691	95	51	44	0	0	0	0	0	0	0	0	0	0	2637
14-Aug	527	2681	1096	106	30	45	0	0	0	0	0	0	0	0	0	0	4485
15-Aug	382	1449	1231	234	53	7	0	0	0	0	0	0	0	0	0	0	3356
Total	2512	10221	4162	527	209	130	0	0	0	0	0	0	0	0	0	0	17761
Percent	14.1	57.5	23.4	3.0	1.2	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0

Appendix A.3. Kenai River south bank sonar counts by sector, 22 June through 15 August, 1987.

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
22-Jun	126	261	289	78	43	16	80	84	83	193	65	61	1379
23-Jun	268	83	88	49	13	9	37	68	40	52	71	99	877
24-Jun	131	35	48	16	8	10	38	53	34	97	62	104	636
25-Jun	73	1	6	7	2	5	35	61	15	139	110	175	629
26-Jun	156	37	24	13	3	8	42	74	85	135	157	118	852
Total	754	417	455	163	69	48	232	340	257	616	465	557	4373
Percent	17.2	9.5	10.4	3.7	1.6	1.1	5.3	7.8	5.9	14.1	10.6	12.7	100.0
27-Jun	118	14	16	8	4	3	23	61	73	200	94	165	779
28-Jun	184	8	12	7	6	16	25	79	46	132	92	164	771
29-Jun	108	74	94	34	18	6	42	73	69	111	80	165	874
30-Jun	345	93	88	37	13	10	26	60	60	73	47	95	947
01-Jul	59	17	32	16	5	5	13	24	39	56	31	24	321
Total	814	206	242	102	46	40	129	297	287	572	344	613	3692
Percent	22.0	5.6	6.6	2.8	1.2	1.1	3.5	8.0	7.8	15.5	9.3	16.6	100.0
02-Jul	45	15	22	8	8	4	15	133	51	48	61	74	484
03-Jul	33	13	15	10	2	0	7	20	69	42	49	122	382
04-Jul	24	12	13	6	2	3	9	23	56	23	48	85	304
05-Jul	24	3	4	15	0	1	8	24	64	43	62	84	332
06-Jul	9	10	12	14	13	11	22	29	19	38	48	36	261
Total	135	53	66	53	25	19	61	229	259	194	268	401	1763
Percent	7.7	3.0	3.7	3.0	1.4	1.1	3.5	13.0	14.7	11.0	15.2	22.7	100.0
07-Jul	34	10	12	15	6	6	18	15	36	55	50	80	337
08-Jul	13	7	15	11	4	0	5	31	19	35	72	94	306
09-Jul	26	6	15	10	2	1	8	21	29	22	35	22	197
10-Jul	29	12	8	5	2	1	11	13	13	36	46	54	230
11-Jul	31	12	17	3	1	1	5	25	16	65	54	82	312
Total	133	47	67	44	15	9	47	105	113	213	257	332	1382
Percent	9.6	3.4	4.8	3.2	1.1	0.7	3.4	7.6	8.2	15.4	18.6	24.0	100.0

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Appendix A.3. (p. 2 of 3)

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
12-Jul	54	141	176	138	20	9	27	51	28	59	77	53	833
13-Jul	60	233	317	373	54	22	76	83	36	121	163	89	1627
14-Jul	81	141	161	58	5	4	42	51	20	72	102	94	831
15-Jul	181	881	2461	1862	189	54	237	90	43	85	237	255	6575
16-Jul	301	1264	2046	1204	165	78	248	106	93	171	231	268	6175
Total	677	2660	5161	3635	433	167	630	381	220	508	810	759	16041
Percent	4.2	16.6	32.2	22.7	2.7	1.0	3.9	2.4	1.4	3.2	5.0	4.7	100.0
17-Jul	462	1188	1411	498	176	161	63	72	64	94	94	85	4368
18-Jul	865	414	201	41	19	3	21	49	35	82	75	129	1934
19-Jul	1390	1113	302	56	2	1	15	17	27	52	57	66	3098
20-Jul	27663	18880	1888	424	22	1	10	8	11	22	45	45	49019
21-Jul	46769	14171	621	458	438	445	437	0	1	8	14	23	63385
Total	77149	35766	4423	1477	657	611	546	146	138	258	285	348	121804
Percent	63.3	29.4	3.6	1.2	0.5	0.5	0.4	0.1	0.1	0.2	0.2	0.3	100.0
22-Jul	55096	15466	408	23	1	0	5	12	11	24	48	44	71138
23-Jul	63395	11993	189	25	10	0	0	0	7	24	45	29	75717
24-Jul	59318	15139	494	26	0	0	3	5	3	17	23	59	75087
25-Jul	56640	10264	383	13	0	0	0	5	10	22	23	33	67393
26-Jul	38587	8944	1396	360	347	347	5	4	3	5	7	390	50395
Total	273036	61806	2870	447	358	347	13	26	34	92	146	555	339730
Percent	80.4	18.2	0.8	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	100.0
27-Jul	29683	9502	1660	1292	1241	1240	0	0	5	6	3	14	44646
28-Jul	37081	6719	73	2	0	0	0	1	1	12	12	21	43922
29-Jul	20851	3490	46	1	0	0	2	0	2	15	28	68	24503
30-Jul	18839	2505	14	0	0	0	1	0	0	3	14	63	21439
31-Jul	41560	5777	41	0	2	0	1	0	0	0	1	3	47385
Total	148014	27993	1834	1295	1243	1240	4	1	8	36	58	169	181895
Percent	81.4	15.4	1.0	0.7	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.1	100.0

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Appendix A.3. (p. 3 of 3)

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
01-Aug	29982	4345	61	1	0	0	0	1	0	0	0	1	34391
02-Aug	22686	2957	46	0	0	0	1	0	0	0	0	1	25691
03-Aug	12902	3635	69	1	0	0	0	0	0	0	2	2	16611
04-Aug	9923	4123	137	4	0	0	0	3	1	0	3	1	14195
05-Aug	11746	3139	60	5	1	1	0	0	1	3	5	0	14961
Total	87239	18199	373	11	1	1	1	4	2	3	10	5	105849
Percent	82.4	17.2	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
06-Aug	8333	2241	43	1	0	0	0	0	0	0	0	2	10620
07-Aug	5037	2335	100	4	0	0	0	0	0	0	0	0	7476
08-Aug	2254	1966	322	36	13	5	2	2	2	0	1	11	4614
09-Aug	2083	1867	292	12	1	0	14	16	7	4	5	29	4330
10-Aug	3638	2082	302	16	0	0	13	12	11	3	11	38	6126
Total	21345	10491	1059	69	14	5	29	30	20	7	17	80	33166
Percent	64.4	31.6	3.2	0.2	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.2	100.0
11-Aug	1402	3776	434	6	1	1	2	2	0	2	26	8	5660
12-Aug	694	2377	160	0	0	0	0	1	0	0	0	2	3234
13-Aug	326	1290	176	2	1	0	0	0	0	0	0	0	1795
14-Aug	254	3010	1742	20	1	0	0	0	0	0	0	0	5027
15-Aug	95	578	688	157	11	0	0	0	0	0	0	0	1529
Total	2771	11031	3200	185	14	1	2	3	0	2	26	10	17245
Percent	16.1	64.0	18.6	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.1	100.0

Appendix A.4. Kenai River north bank sonar counts by hour, 22 June through 15 August, 1987.

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
22-Jun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	4	1	10	4	4	8		
23-Jun	7	26	5	15	13	30	19	8	6	17	11	8	2	1	2	2	9	0	22	0	0	0	0	0
24-Jun	0	0	0	0	17	4	0	0	0	2	0	1	1	0	0	0	0	15	0	0	0	0	0	0
25-Jun	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	4	12	2	1	11	11	9	
26-Jun	12	15	4	7	8	8	4	18	0	0	0	0	0	0	0	0	0	0	0	17	19	16	16	17
27-Jun	12	8	5	4	10	13	38	70	60	46	47	81	68	22	19	30	69	58	26	23	41	34	16	25
28-Jun	37	37	16	19	30	22	49	99	65	35	90	32	32	30	20	85	72	79	27	67	31	41	12	23
29-Jun	25	16	25	18	28	24	38	18	13	23	31	9	13	13	10	13	23	14	15	10	11	22	37	76
30-Jun	60	17	41	21	75	30	35	50	5	6	0	0	0	0	0	0	0	0	0	0	0	0	11	18
01-Jul	52	9	23	17	41	29	40	30	1	6	17	45	13	9	1	1	6	11	6	10	13	6	10	13
02-Jul	17	17	17	14	17	5	7	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	10	6	4	6	4	3	3	4	8	14	10
04-Jul	12	16	9	16	14	12	12	20	20	11	10	18	8	8	7	1	5	6	5	12	7	10	15	10
05-Jul	8	15	13	11	14	11	16	25	8	18	9	8	3	8	4	2	3	6	12	8	5	34	16	13
06-Jul	18	17	15	8	10	20	14	13	8	15	8	15	6	3	3	7	10	4	7	7	9	9	12	15
07-Jul	6	15	8	13	8	21	29	10	9	19	11	9	6	17	8	5	12	13	25	27	11	8	7	11
08-Jul	8	12	5	5	9	8	21	9	14	5	8	4	9	8	4	4	4	3	5	7	12	7	10	11
09-Jul	4	5	10	19	12	10	14	12	5	11	5	3	1	11	0	15	3	5	4	7	7	3	3	3
10-Jul	8	13	10	15	14	24	28	16	11	11	6	5	5	7	0	3	1	1	6	3	2	0	0	1
11-Jul	2	1	3	0	4	14	20	0	3	7	0	5	5	2	0	0	0	0	0	4	1	2	2	2
12-Jul	3	0	1	0	3	0	2	3	9	1	3	14	9	13	25	21	12	2	14	6	3	9	7	12
13-Jul	18	363	417	54	2	18	5	4	6	6	6	10	11	23	0	138	226	197	131	243	286	213	266	461

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Appendix A.4. (p 2 of 3)

Counts by Hour

Date	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
14-Jul	244	206	297	89	82	200	148	244	264	230	173	99	82	32	0	0	0	0	0	0	0	0	0	0
15-Jul	263	323	333	247	157	245	151	360	277	255	155	239	665	828	723	956	1542	2048	1460	1529	1361	1270	1565	1210
16-Jul	736	356	131	173	762	2334	1629	1527	1281	1433	532	663	1293	643	417	295	425	702	1859	6366	1266	131	126	204
17-Jul	134	177	115	78	74	95	124	61	622	2310	303	114	53	74	74	53	87	121	123	89	74	52	65	42
18-Jul	36	35	26	51	52	28	32	65	112	133	111	133	129	56	78	127	179	271	335	650	1794	2759	3597	3284
19-Jul	588	432	366	567	459	632	0	0	0	331	364	493	907	461	826	1160	1660	1246	1359	1065	706	763	507	
20-Jul	1578	1299	1188	1160	1433	1869	2000	2790	1893	2482	2195	1829	2547	2458	2173	3114	2804	2519	3887	4468	5064	5349	5807	5942
21-Jul	4591	3817	1132	1285	2232	3655	4264	4513	5119	4598	3370	2763	3140	2853	2470	3082	3795	4514	4217	4820	4268	4678	4734	3863
22-Jul	2753	2181	1979	1842	1814	2414	2300	1987	1986	2130	2033	2281	2592	2908	2787	3010	2837	3305	3255	2857	3422	3658	3817	4029
23-Jul	4129	2964	2869	1737	1620	1713	1790	2169	2914	3888	4278	2934	2606	2839	3294	3298	2975	2994	3005	2773	2733	2828	1521	1579
24-Jul	3553	3065	2251	1702	2134	2405	2049	2608	2272	2198	2271	2169	2477	2672	2442	2364	2917	2817	1909	2268	2455	4772	3713	2681
25-Jul	2761	2441	1913	1545	1302	2131	2243	2356	2915	2762	2961	3154	2940	3096	2931	2692	2677	2946	2764	2840	3068	3221	2939	2569
26-Jul	2245	2097	1917	1435	1732	2139	2315	2861	3303	2865	2745	2807	2715	2393	2335	2864	2922	2765	2805	3201	3047	3000	2389	2386
27-Jul	2103	1456	1283	978	1450	1915	1448	1712	2028	1506	1455	1251	1173	1173	1411	1877	2717	2179	2289	2134	2193	2247	1732	1277
28-Jul	873	1086	908	721	655	1523	827	523	845	828	1090	1227	1006	1134	1559	1515	1944	2261	1720	2367	3183	1480	629	961
29-Jul	588	432	366	567	459	632	0	0	0	331	364	493	907	461	826	1160	1660	1246	1359	1065	706	763	507	
30-Jul	207	379	319	232	291	447	388	343	323	547	528	590	658	576	747	1129	1734	1291	1017	830	1433	941	640	380
31-Jul	410	297	135	107	104	233	513	513	1106	799	1159	1740	1495	615	427	304	860	899	916	1070	1622	1200	1140	830
01-Aug	748	595	411	232	281	681	672	514	549	517	638	681	582	1019	993	866	970	1369	1239	1167	1343	1362	1285	673
02-Aug	1124	517	267	164	192	832	918	898	667	712	1209	1291	1243	970	937	1355	1561	2242	2242	2367	2224	1832	1426	1325
03-Aug	372	265	263	136	134	115	120	96	193	575	377	622	854	576	496	587	629	742	856	1254	1220	1120	743	556
04-Aug	368	264	184	188	213	213	361	224	258	195	287	384	343	415	342	365	357	425	542	278	223	261	337	98

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Appendix A.4. (p 3 of 3)

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
05-Aug	95	94	106	77	85	96	157	321	312	334	313	330	535	333	266	491	426	282	252	163	184	173	253	226
06-Aug	153	152	66	84	20	61	121	155	491	155	0	0	0	0	307	290	241	205	366	336	349	318	221	143
07-Aug	95	111	83	49	52	82	152	192	183	208	293	309	516	503	337	368	453	269	451	550	497	493	410	196
08-Aug	162	60	44	49	25	63	138	193	248	214	163	148	120	242	128	202	187	136	154	233	222	273	323	150
09-Aug	92	120	83	77	47	71	157	212	156	148	205	99	62	179	142	189	228	264	358	408	371	415	498	340
10-Aug	164	106	81	53	49	116	200	220	242	226	214	153	148	118	277	338	545	320	217	420	553	433	385	180
11-Aug	113	91	72	105	60	114	118	183	179	146	107	63	142	209	272	302	265	286	288	273	168	84	149	89
12-Aug	81	53	73	51	60	80	142	146	201	278	261	135	157	169	115	130	159	206	137	228	132	111	128	172
13-Aug	102	91	59	76	64	71	158	111	97	94	190	112	101	92	130	69	145	124	87	90	129	212	122	111
14-Aug	91	57	50	58	61	117	200	189	217	278	258	210	181	118	79	119	222	243	349	345	302	245	282	214
15-Aug	133	137	83	82	160	121	180	301	364	207	178	102	106	137	139	69	87	84	62	99	138	152	105	130
Percent	3.9	3.6	3.1	2.6	4.0	4.1	4.5	4.3	3.9	4.5	3.4	3.4	3.5	5.4	2.9	3.6	4.3	5.1	5.0	5.3	5.5	5.6	5.4	5.1

Appendix A.5. Kenai River south bank sonar counts by hour, 22 June through 15 August, 1987.

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
22-Jun	109	101	49	33	55	44	53	56	51	68	64	0	0	39	58	52	71	78	65	52	45	145	59	32
23-Jun	48	60	36	35	21	37	12	39	45	39	72	42	43	27	39	25	43	44	23	56	22	22	23	24
24-Jun	41	37	26	17	12	48	6	9	30	30	18	37	32	26	33	25	19	14	10	38	33	46	22	27
25-Jun	27	13	19	19	14	25	27	24	11	14	26	33	28	24	24	29	20	28	55	43	39	30	36	21
26-Jun	18	30	52	40	31	42	23	20	30	29	29	65	29	27	54	35	48	51	60	29	21	25	21	43
27-Jun	23	20	15	23	18	45	33	22	31	35	22	25	47	17	62	39	52	31	46	26	47	54	32	14
28-Jun	16	5	13	9	21	26	15	16	29	56	5	71	49	47	43	45	40	52	61	52	37	27	24	12
29-Jun	9	34	17	20	15	10	15	29	31	21	50	27	30	24	36	54	40	31	43	42	71	74	60	91
30-Jun	43	52	63	67	30	33	25	37	66	63	52	85	31	30	44	18	16	23	59	19	20	23	26	22
01-Jul	8	13	4	4	4	17	15	17	8	10	24	16	13	8	17	13	14	15	24	12	23	17	7	18
02-Jul	22	22	26	14	16	22	24	7	12	16	23	11	19	24	15	16	19	14	15	44	26	25	22	30
03-Jul	9	24	21	12	13	14	16	16	16	19	20	13	18	15	14	12	30	8	12	11	12	14	28	15
04-Jul	28	21	19	14	9	17	14	17	9	3	10	0	10	6	3	13	13	8	9	13	14	8	18	28
05-Jul	9	18	20	7	10	15	7	10	4	6	5	12	3	6	10	15	14	20	14	31	29	23	21	23
06-Jul	3	12	12	12	12	12	12	12	16	9	10	5	7	7	3	0	13	5	11	10	21	24	17	16
07-Jul	20	12	11	6	19	4	9	22	6	13	20	10	8	12	0	10	12	26	16	12	16	18	24	31
08-Jul	8	12	11	13	1	6	31	10	6	8	5	15	16	11	4	23	26	6	9	20	16	18	20	11
09-Jul	8	7	12	9	1	7	3	5	3	1	8	7	17	14	11	13	7	10	10	11	9	8	9	7
10-Jul	9	14	8	3	2	7	8	14	9	5	8	3	10	3	10	4	6	13	12	32	12	11	17	10
11-Jul	7	16	11	3	4	6	12	27	24	14	10	14	3	17	23	13	8	17	20	29	3	9	16	6
12-Jul	27	26	22	20	6	2	10	9	10	11	8	41	71	63	107	91	13	17	42	57	47	44	40	49
13-Jul	27	26	22	20	6	2	10	9	31	17	26	51	76	156	104	203	107	78	95	155	147	126	86	47

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Appendix A.5. (p 2 of 3)

Counts by Hour

Date	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
14-Jul	36	91	114	44	12	14	38	30	29	27	18	38	25	14	29	27	34	13	16	29	24	23	40	66
15-Jul	74	91	307	109	51	39	73	80	80	55	70	32	192	251	320	1083	1150	684	558	480	377	212	105	102
16-Jul	538	574	462	242	193	130	95	97	592	252	365	240	241	112	140	194	217	400	237	237	165	162	235	55
17-Jul	155	158	165	142	30	57	62	180	180	180	232	365	180	180	180	318	243	233	184	286	251	182	116	109
18-Jul	134	333	285	176	88	41	60	38	39	81	47	30	19	46	29	71	61	51	30	39	71	58	58	49
19-Jul	20	32	34	40	16	21	51	30	37	13	30	69	42	50	80	68	50	194	346	440	352	288	332	463
20-Jul	389	371	280	308	218	148	406	706	921	836	1530	3452	2468	2301	1928	2407	1760	1191	3177	3880	5618	4886	4527	5311
21-Jul	4469	1686	2623	2690	2705	2162	2895	2182	1647	1270	2005	1527	808	3296	3064	4266	1910	3003	2946	2152	3035	3793	3532	3719
22-Jul	2826	2666	1361	1719	2454	1597	2323	3431	3085	2884	3501	3911	3881	3578	3294	2274	3051	4311	3579	3363	3416	2259	3292	3082
23-Jul	2971	2731	1893	1576	1930	1664	2747	3482	3717	3190	2814	3284	3251	2774	2737	2974	3229	2915	4607	4600	5176	4128	4252	3075
24-Jul	2005	1987	2090	1936	1814	3408	2624	3567	3029	2367	2304	2558	1360	1351	2352	4110	4407	4397	4984	5697	6197	2925	3298	4320
25-Jul	4042	2373	2120	1760	1928	2727	2629	3042	2905	2209	2299	2302	1647	3072	2151	1883	2050	2033	2364	2851	5551	5318	4207	3930
26-Jul	3487	2434	1581	1870	2455	2589	2200	2025	1604	950	1146	1638	1405	888	834	271	2100	2116	3723	4757	3419	2612	2526	1765
27-Jul	1955	1139	1341	1050	915	1117	1412	1308	1860	635	930	1596	2267	1860	1860	2065	3614	2839	4070	3700	2075	1146	2032	
28-Jul	1828	1080	671	582	440	937	1215	3037	1744	1670	1103	1020	1223	1461	1830	3327	4203	3522	3439	3230	1141	2135	1707	1377
29-Jul	1344	1081	695	711	641	334	867	1144	1152	1007	1397	1556	960	1120	263	1507	1885	1840	1221	659	821	813	685	800
30-Jul	660	447	439	360	338	281	391	531	419	596	833	1000	858	745	613	538	1663	2264	1506	1274	1298	1515	1581	1289
31-Jul	781	777	411	351	773	831	1305	1828	2478	3148	3522	3743	3162	2963	3011	2759	2932	3219	2699	2493	1412	1261	736	790
01-Aug	1509	522	367	473	244	813	1115	1102	1232	1032	1046	1002	1684	1904	1513	2370	2047	1503	3342	3110	2217	1790	1468	986
02-Aug	815	211	504	217	249	600	867	664	1409	1407	1682	1410	1139	1039	881	1789	1383	790	1725	2412	1734	930	912	922
03-Aug	317	216	192	133	118	138	439	202	462	568	704	1047	1102	752	1186	1159	946	1230	1206	1207	983	1181	684	439
04-Aug	303	148	88	137	88	78	144	168	227	452	349	483	994	649	1205	1078	1093	1040	923	1053	1158	847	879	611

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Appendix A.5. (p 3 of 3)

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
05-Aug	592	145	100	84	59	100	140	464	634	687	643	1001	1085	1054	805	606	980	1007	888	1005	1012	901	628	351
06-Aug	145	55	55	44	54	56	101	203	279	354	354	510	797	710	747	824	746	655	905	690	666	779	612	279
07-Aug	56	45	46	23	32	53	61	164	230	163	185	434	366	857	500	591	776	839	683	455	357	367	126	67
08-Aug	67	32	24	20	24	21	38	83	158	194	146	146	455	285	349	186	152	295	376	432	450	357	188	136
09-Aug	55	29	14	25	15	20	62	55	111	202	154	73	113	274	321	359	500	363	225	351	390	329	113	177
10-Aug	112	78	60	45	43	56	76	111	111	143	393	178	190	261	407	495	586	661	678	403	354	320	178	187
11-Aug	137	84	71	51	48	69	40	76	124	169	234	231	457	434	338	329	334	434	367	344	350	312	353	274
12-Aug	117	66	82	18	51	20	8	63	75	211	256	102	271	240	255	211	229	133	158	94	113	118	144	199
13-Aug	111	94	73	84	37	10	31	34	38	75	88	89	62	169	72	105	30	79	89	77	73	78	50	147
14-Aug	115	112	54	82	47	32	30	46	76	153	207	205	377	312	259	302	261	457	414	395	311	247	234	299
15-Aug	149	56	47	17	40	23	14	31	42	39	119	116	77	100	71	56	19	22	16	57	64	48	123	183
Percent	3.7	3.6	3.3	2.4	1.9	2.4	2.6	3.1	3.4	3.4	3.9	4.2	4.4	4.5	4.6	5.3	5.3	5.4	5.8	6.3	5.7	5.3	4.7	4.7

Appendix A.6. Estimated salmon escapement on the north bank of the Kenai River, 22 June through 15 August, 1987. Daily fish targets apportioned to species by fish wheel catch.

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
22-Jun	125	125	3	3	0	0	0	0
23-Jun	188	313	4	7	0	0	0	0
24-Jun	45	358	1	8	0	0	0	0
25-Jun	64	421	1	10	0	0	0	0
26-Jun	287	708	6	16	0	0	0	0
27-Jun	805	1,513	18	34	0	0	0	0
28-Jun	1,021	2,534	23	57	0	0	0	0
29-Jun	512	3,046	12	69	0	0	0	0
30-Jun	356	3,402	8	77	0	0	0	0
01-Jul	393	3,795	9	86	0	0	0	0
02-Jul	94	3,889	2	88	0	0	0	0
03-Jul	77	3,966	2	90	0	0	0	0
04-Jul	253	4,220	6	95	0	0	0	0
05-Jul	257	4,477	6	101	0	0	0	0
06-Jul	241	4,717	5	107	0	0	0	0
07-Jul	297	5,015	7	113	0	0	0	0
08-Jul	192	5,206	4	118	0	0	0	0
09-Jul	203	5,410	5	122	0	0	0	0
10-Jul	186	5,595	4	127	0	0	0	0
11-Jul	78	5,674	2	128	0	0	0	0
12-Jul	187	5,860	4	133	0	0	0	0
13-Jul	3,912	9,773	89	221	0	0	0	0
14-Jul	3,888	13,661	88	309	0	0	0	0
15-Jul	17,760	31,421	402	711	0	0	0	0
16-Jul	10,993	42,414	249	960	0	0	0	0
17-Jul	9,773	52,187	142	1,102	0	0	95	95
18-Jul	7,474	59,661	109	1,211	0	0	73	167
19-Jul	14,074	73,735	0	1,211	0	0	0	167
20-Jul	63,492	137,227	0	1,211	0	0	0	167
21-Jul	87,481	224,708	0	1,211	0	0	188	355
22-Jul	63,797	288,506	376	1,586	0	0	0	355
23-Jul	62,538	351,044	0	1,586	0	0	0	355
24-Jul	57,158	408,202	0	1,586	0	0	0	355
25-Jul	63,171	471,373	0	1,586	0	0	0	355
26-Jul	61,283	532,656	0	1,586	0	0	0	355
27-Jul	41,728	574,384	224	1,810	0	0	224	579
28-Jul	30,537	604,921	0	1,810	0	0	552	1,130
29-Jul	17,716	622,637	0	1,810	81	81	0	1,130
30-Jul	16,138	638,775	0	1,810	0	81	0	1,130

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Appendix A.6. (p. 2 of 2)

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
31-Jul	18,494	657,269	0	1,810	0	81	0	1,130
01-Aug	28,515	685,784	0	1,810	0	81	0	1,130
02-Aug	19,252	705,037	0	1,810	135	215	0	1,130
03-Aug	12,709	717,746	0	1,810	128	343	64	1,194
04-Aug	7,125	724,871	0	1,810	0	343	0	1,194
05-Aug	5,726	730,597	33	1,842	130	473	33	1,227
06-Aug	5,390	735,986	0	1,842	128	601	128	1,355
07-Aug	6,756	742,742	0	1,842	96	697	0	1,355
08-Aug	3,642	746,384	53	1,896	160	857	21	1,376
09-Aug	4,719	751,104	36	1,931	142	999	24	1,400
10-Aug	5,464	756,567	0	1,931	294	1,294	0	1,400
11-Aug	3,517	760,084	0	1,931	361	1,655	0	1,400
12-Aug	3,165	763,250	0	1,931	240	1,894	0	1,400
13-Aug	2,245	765,495	0	1,931	358	2,252	24	1,424
14-Aug	3,491	768,985	0	1,931	994	3,246	0	1,424
15-Aug	2,587	771,573	75	2,006	656	3,902	37	1,462

Appendix A.7. Estimated salmon escapement on the south bank of the Kenai River, 22 June through 15 August, 1987. Daily fish targets apportioned to species by fish wheel catch.

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
22-Jun	1,428	1,428	32	32	0	0	0	0
23-Jun	854	2,281	19	52	0	0	0	0
24-Jun	613	2,895	14	65	0	0	0	0
25-Jun	639	3,533	14	80	0	0	0	0
26-Jun	842	4,375	19	99	0	0	0	0
27-Jun	716	5,091	16	115	0	0	0	0
28-Jun	742	5,833	17	132	0	0	0	0
29-Jun	862	6,695	19	151	0	0	0	0
30-Jun	962	7,657	22	173	0	0	0	0
01-Jul	317	7,974	7	180	0	0	0	0
02-Jul	483	8,457	11	191	0	0	0	0
03-Jul	373	8,829	8	200	0	0	0	0
04-Jul	296	9,126	7	206	0	0	0	0
05-Jul	328	9,453	7	214	0	0	0	0
06-Jul	234	9,687	5	219	0	0	0	0
07-Jul	321	10,008	7	226	0	0	0	0
08-Jul	297	10,305	7	233	0	0	0	0
09-Jul	200	10,505	5	238	0	0	0	0
10-Jul	225	10,730	5	243	0	0	0	0
11-Jul	304	11,034	7	250	0	0	0	0
12-Jul	815	11,849	18	268	0	0	0	0
13-Jul	1,592	13,441	36	304	0	0	0	0
14-Jul	812	14,253	18	322	0	0	0	0
15-Jul	6,430	20,682	145	468	0	0	0	0
16-Jul	5,943	26,625	134	602	0	0	0	0
17-Jul	4,253	30,877	62	664	0	0	41	41
18-Jul	1,888	32,766	27	692	0	0	18	60
19-Jul	4,267	37,033	0	692	0	0	0	60
20-Jul	50,360	87,393	0	692	0	0	0	60
21-Jul	62,811	150,204	368	1,060	0	0	135	194
22-Jul	70,722	220,926	416	1,476	0	0	0	194
23-Jul	75,717	296,643	0	1,476	0	0	0	194
24-Jul	75,080	371,723	0	1,476	0	0	0	194
25-Jul	67,393	439,116	0	1,476	0	0	0	194
26-Jul	50,395	489,511	0	1,476	0	0	0	194
27-Jul	44,258	533,768	0	1,476	0	0	237	431
28-Jul	43,142	576,911	0	1,476	0	0	780	1,211
29-Jul	24,392	601,303	0	1,476	111	111	0	1,211
30-Jul	21,619	622,922	0	1,476	0	111	0	1,211

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Appendix A.7. (p. 2 of 2)

Date	Sockeye		Pink		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
31-Jul	47,381	670,303	0	1,476	0	111	0	1,211
01-Aug	34,391	704,694	0	1,476	0	111	0	1,211
02-Aug	25,513	730,207	0	1,476	178	289	0	1,211
03-Aug	16,361	746,567	0	1,476	165	454	82	1,293
04-Aug	14,195	760,762	0	1,476	0	454	0	1,293
05-Aug	14,468	775,230	0	1,476	329	783	82	1,376
06-Aug	10,139	785,370	0	1,476	240	1,023	240	1,616
07-Aug	7,371	792,741	0	1,476	105	1,128	0	1,616
08-Aug	4,334	797,075	0	1,476	191	1,318	25	1,641
09-Aug	4,153	801,228	0	1,476	125	1,444	21	1,662
10-Aug	5,813	807,041	0	1,476	313	1,757	0	1,662
11-Aug	5,134	812,175	0	1,476	527	2,284	0	1,662
12-Aug	3,006	815,180	0	1,476	227	2,511	0	1,662
13-Aug	1,534	816,714	0	1,476	245	2,756	17	1,679
14-Aug	7,404	824,118	0	1,476	2,108	4,864	0	1,679
15-Aug	1,179	825,297	0	1,476	299	5,163	17	1,696

Appendix A.8. Daily adjusted fish wheel catch by species for the Kenai River, 9 July through 15 August 1987.

Date	Hours Open ^a	Sockeye		Pink		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
09-Jul	22.00	0	0	0	0	0	0	0	0
10-Jul	23.50	6	6	0	0	0	0	0	0
11-Jul	21.00	3	9	1	1	0	0	0	0
12-Jul	23.10	6	15	1	2	0	0	0	0
13-Jul	23.00	27	42	1	3	0	0	0	0
14-Jul	29.00	17	59	1	4	0	0	0	0
15-Jul	22.30	71	130	1	5	0	0	0	0
16-Jul	17.40	91	221	0	5	0	0	0	0
17-Jul	21.80	95	316	1	6	0	0	1	1
18-Jul	22.80	111	427	2	8	0	0	1	2
19-Jul	24.00	17	444	0	8	0	0	0	2
20-Jul	11.10	653	1,097	0	8	0	0	0	2
21-Jul	3.75	1,866	2,963	0	8	0	0	4	6
22-Jul	6.25	1,699	4,662	10	18	0	0	0	6
23-Jul	2.50	234	4,896	0	18	0	0	0	6
24-Jul	9.30	234	5,130	0	18	0	0	0	6
25-Jul	6.70	344	5,474	0	18	0	0	0	6
26-Jul	7.75	279	5,753	0	18	0	0	0	6
27-Jul	9.25	560	6,313	3	21	0	0	3	9
28-Jul	5.30	498	6,811	0	21	0	0	9	18
29-Jul	7.20	660	7,471	0	21	3	3	0	18
30-Jul	15.00	187	7,658	0	21	0	3	0	18
31-Jul	16.80	239	7,897	0	21	0	3	0	18
01-Aug	13.25	386	8,283	0	21	0	3	0	18
02-Aug	12.75	286	8,569	0	21	2	5	0	18
03-Aug	8.80	596	9,165	0	21	6	11	3	21
04-Aug	16.50	292	9,457	0	21	0	11	0	21
05-Aug	15.40	352	9,809	2	23	8	19	2	23
06-Aug	14.80	422	10,231	0	23	10	29	10	33
07-Aug	11.00	493	10,724	0	23	7	36	0	33
08-Aug	14.50	341	11,065	5	28	15	51	2	35
09-Aug	13.75	398	11,463	3	31	12	63	2	37
10-Aug	9.20	427	11,890	0	31	23	86	0	37
11-Aug	12.30	302	12,192	0	31	31	117	0	37
12-Aug	11.80	185	12,377	0	31	14	131	0	37
13-Aug	9.30	276	12,653	0	31	44	175	3	40
14-Aug	7.00	446	13,099	0	31	127	302	0	40
15-Aug ^b	12.50	138	13,237	4	35	35	337	2	42

^a Fish wheel catch adjusted for 24 h: (daily catch * 24 h)/hours open.

^b Actual total catch by species: 4536 sockeye salmon; 31 pink salmon; 139 coho salmon; 13 chinook salmon.

Appendix A.8. Daily adjusted fish wheel catch by species for the Kenai River, 9 July through 15 August 1987.

Date	Hours Open ¹	Sockeye		Pink		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
09-Jul	22.00	0	0	0	0	0	0	0	0
10-Jul	23.50	6	6	0	0	0	0	0	0
11-Jul	21.00	3	9	1	1	0	0	0	0
12-Jul	23.10	6	15	1	2	0	0	0	0
13-Jul	23.00	27	42	1	3	0	0	0	0
14-Jul	29.00	17	59	1	4	0	0	0	0
15-Jul	22.30	71	130	1	5	0	0	0	0
16-Jul	17.40	91	221	0	5	0	0	0	0
17-Jul	21.80	95	316	1	6	0	0	1	1
18-Jul	22.80	111	427	2	8	0	0	1	2
19-Jul	24.00	17	444	0	8	0	0	0	2
20-Jul	11.10	653	1,097	0	8	0	0	0	2
21-Jul	3.75	1,866	2,963	0	8	0	0	4	6
22-Jul	6.25	1,699	4,662	10	18	0	0	0	6
23-Jul	2.50	234	4,896	0	18	0	0	0	6
24-Jul	9.30	234	5,130	0	18	0	0	0	6
25-Jul	6.70	344	5,474	0	18	0	0	0	6
26-Jul	7.75	279	5,753	0	18	0	0	0	6
27-Jul	9.25	560	6,313	3	21	0	0	3	9
28-Jul	5.30	498	6,811	0	21	0	0	9	18
29-Jul	7.20	660	7,471	0	21	3	3	0	18
30-Jul	15.00	187	7,658	0	21	0	3	0	18
31-Jul	16.80	239	7,897	0	21	0	3	0	18
01-Aug	13.25	386	8,283	0	21	0	3	0	18
02-Aug	12.75	286	8,569	0	21	2	5	0	18
03-Aug	8.80	596	9,165	0	21	6	11	3	21
04-Aug	16.50	292	9,457	0	21	0	11	0	21
05-Aug	15.40	352	9,809	2	23	8	19	2	23
06-Aug	14.80	422	10,231	0	23	10	29	10	33
07-Aug	11.00	493	10,724	0	23	7	36	0	33
08-Aug	14.50	341	11,065	5	28	15	51	2	35
09-Aug	13.75	398	11,463	3	31	12	63	2	37
10-Aug	9.20	427	11,890	0	31	23	86	0	37
11-Aug	12.30	302	12,192	0	31	31	117	0	37
12-Aug	11.80	185	12,377	0	31	14	131	0	37
13-Aug	9.30	276	12,653	0	31	44	175	3	40
14-Aug	7.00	446	13,099	0	31	127	302	0	40
15-Aug ²	12.50	138	13,237	4	35	35	337	2	42

¹ Fish wheel catch adjusted for 24 h: (daily catch * 24 h)/hours open.

² Actual total catch by species: 4536 sockeye salmon; 31 pink salmon; 139 coho salmon; 13 chinook salmon.

Appendix A.9. Length composition of the major age classes of sockeye salmon in the Kenai River, 1980-87. Length measured from mid-eye to fork of tail.

Year	Age Class	Male				Female				Total		
		Ave Length (mm)	Stndrd Error	Sample Size	Ave Length (mm)	Stndrd Error	Sample Size	Ave Length (mm)	Stndrd Error	Sample Size	Ratio Male/ Female	
1980	1.2	482	3.9	168	494	3.6	100	486		268	1.7:1	
1981		493	5.6	85	513	5.6	73	502		158	1.2:1	
1982		483	8.9	70	505	12.6	32	490	10.0	63	2.2:1	
1983		524	8.7	25	520	5.5	30	522	5.0	55	0.8:1	
1984		474	2.8	280	473	3.5	196	474	2.2	476	1.4:1	
1985		492	3.3	184	490	3.0	186	491	2.2	370	1.0:1	
1986		488	4.3	155	492	6.2	96	489	3.6	251	1.6:1	
1987		514	7.6	39	503	5.4	56	507	4.5	95	0.7:1	
1980	1.3	580	2.9	180	561	2.2	192	570		372	0.9:1	
1981		590	1.8	290	569	1.3	430	577		720	0.7:1	
1982		596	1.9	723	572	1.3	841	583	1.6	1564	0.9:1	
1983		598	2.1	215	577	1.2	269	586	1.1	484	0.8:1	
1984		582	1.6	385	559	1.4	395	571	1.0	780	1.0:1	
1985		575	1.5	496	552	0.9	824	560	0.8	1320	0.6:1	
1986		584	3.1	112	564	1.9	200	571	1.7	312	0.6:1	
1987		605	2.0	183	586	1.2	401	592	1.1	584	0.5:1	
1984	2.2	505	3.6	116	508	3.0	159	507	2.3	275	0.7:1	
1985		513	3.5	132	513	2.6	196	513	2.1	328	0.7:1	
1980	2.3	589	2.7	67	579	3.2	80	584		147	0.8:1	
1982		598	4.9	46	580	8.4	21	592	6.0	67	2.2:1	
1983		595	4.2		582	4.2		587	3.0	61	0.7:1	
1984		570	2.3	210	557	1.7	192	564	1.5			
1985		270	2.8	106	555	2.1	129	562	1.7	235	0.8:1	
1986		585	5.2	52	568	2.8	89	575	2.6	142	0.6:1	

Appendix A.10. Weight composition of the major age classes of sockeye salmon in the Kenai River, 1981-87.

Year	Age Class	Male			Female			Total		
		Ave Weight (Kg)	Stndrd Error	Sample Size	Ave Weight (Kg)	Stndrd Error	Sample Size	Ave Weight (Kg)	Stndrd Error	Sample Size
1981	1.2	2.1	0.07	85	2.3	0.07	73	2.2		158
		1.9	0.15	47	2.0	0.20	16	1.9	0.17	63
		2.2	0.09	25	2.2	0.07	30	2.2	0.06	55
		1.9	0.07	66	1.9	0.07	54	1.9	0.05	120
		1.9	0.06	56	1.8	0.05	45	1.8	0.04	101
		2.1	0.06	129	1.9	0.05	77	2.1	0.04	206
		2.3	0.10	15	1.9	0.07	31	2.0	0.06	46
1982	1.3	3.8	0.04	290	3.2	0.02	430	3.4		720
		4.0	0.06	413	3.3	0.04	444	3.7	0.05	857
		3.7	0.04	215	3.2	0.02	269	3.4	0.02	484
		3.2	0.07	96	3.0	0.05	103	3.1	0.04	199
		3.2	0.05	127	2.7	0.02	218	2.9	0.02	345
		3.6	0.08	87	3.1	0.04	173	3.3	0.04	260
		3.8	0.04	116	3.3	0.02	237	3.5	0.02	353
1983	2.2	2.3	0.08	42	2.3	0.06	46	2.3		88
		2.0	0.07	33	1.8	0.05	50	1.9	0.04	83
1984	2.3	3.3	0.13	20	3.3	0.10	27	3.3		47
		3.6	0.16	26	3.3	0.26	13	3.5	0.19	39
		3.5	0.10	26	3.2	0.07	35	3.3	0.06	61
		3.2	0.10	36	2.8	0.05	62	3.0	0.05	98
		3.0	0.10	26	2.7	0.06	21	2.8	0.06	47
		3.6	0.09	46	3.1	0.06	76	3.3	0.05	122

Appendix A11. Estimated salmon escapement into the Kaslof River, north and south banks combined, 13 June through 7 August, 1987. Daily fish targets apportioned to species by fish wheel catch.

Date	Sockeye		Pink		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum
		11,044 ^a				
13-Jun	1,738	12,782	0	0	18	0
14-Jun	2,572	15,353	0	0	27	27
15-Jun	2,937	18,290	0	0	31	59
16-Jun	4,486	22,776	0	0	48	106
17-Jun	3,753	26,529	0	0	40	146
18-Jun	3,266	29,796	0	0	35	181
19-Jun	6,584	36,379	0	0	70	251
20-Jun	6,191	42,571	0	0	66	317
21-Jun	4,739	47,309	0	0	50	367
22-Jun	1,919	49,228	0	0	20	388
23-Jun	931	50,159	0	0	10	398
24-Jun	1,076	51,234	0	0	11	409
25-Jun	1,638	52,872	0	0	17	426
26-Jun	1,450	54,322	0	0	15	442
27-Jun	1,015	55,337	0	0	11	453
28-Jun	1,148	56,485	0	0	12	465
29-Jun	2,895	59,380	0	0	31	496
30-Jun	2,654	62,034	0	0	28	524
01-Jul	4,558	66,591	0	0	48	572
02-Jul	7,314	73,905	0	0	78	650
03-Jul	5,125	79,031	0	0	55	705
04-Jul	4,267	83,298	0	0	0	705
05-Jul	5,721	89,019	0	0	0	705
06-Jul	6,956	95,975	0	0	0	705
07-Jul	4,363	100,338	27	27	240	945
08-Jul	4,744	105,082	29	56	261	1,206
09-Jul	4,124	109,205	40	96	182	1,388
10-Jul	2,891	112,096	38	134	229	1,617
11-Jul	1,684	113,780	0	134	99	1,717
12-Jul	5,995	119,775	0	134	354	2,071
13-Jul	6,774	126,549	54	189	253	2,323
14-Jul	2,966	129,514	38	226	94	2,418
15-Jul	16,787	146,302	0	226	229	2,647
16-Jul	3,220	149,522	6	232	39	2,686
17-Jul	2,038	151,560	30	261	118	2,804
18-Jul	2,831	154,391	0	261	198	3,002
19-Jul	19,834	174,225	0	261	464	3,466
20-Jul	7,853	182,078	0	261	83	3,549

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Date	Sockeye		Pink		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum
21-Jul	8,647	190,725	0	261	81	3,630
22-Jul	11,014	201,740	99	361	198	3,828
23-Jul	10,442	212,181	69	429	275	4,103
24-Jul	5,322	217,503	0	429	33	4,136
25-Jul	3,884	221,387	43	473	43	4,180
26-Jul	2,075	223,462	23	496	23	4,203
27-Jul	2,293	225,755	70	566	445	4,647
28-Jul	2,557	228,312	78	644	496	5,143
29-Jul	2,229	230,541	68	713	432	5,575
30-Jul	3,619	234,159	111	823	702	6,277
31-Jul	5,608	239,767	172	995	1,087	7,364
01-Aug	3,302	243,069	101	1,096	640	8,004
02-Aug	1,590	244,659	49	1,145	308	8,313
03-Aug	1,050	245,709	32	1,177	204	8,516
04-Aug	1,021	246,730	31	1,208	198	8,714
05-Aug	920	247,651	28	1,236	178	8,892
06-Aug	825	248,475	25	1,262	160	9,052
07-Aug	771	249,246	24	1,285	149	9,202

^a Estimated escapement prior to 13 June.

Appendix A12. Estimated salmon escapement on the north bank of the Kaslof River, 13 June through 7 August, 1987. Daily fish targets apportioned to species by fish wheel catch.

Date	Sockeye		Pink		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum
13-Jun	1,126	1,126	0	0	12	0
14-Jun	2,106	3,232	0	0	22	22
15-Jun	2,242	5,474	0	0	24	46
16-Jun	2,972	8,446	0	0	32	78
17-Jun	1,852	10,298	0	0	20	98
18-Jun	1,768	12,067	0	0	19	116
19-Jun	3,321	15,387	0	0	35	152
20-Jun	2,583	17,970	0	0	27	179
21-Jun	1,864	19,834	0	0	20	199
22-Jun	713	20,547	0	0	8	207
23-Jun	691	21,238	0	0	7	214
24-Jun	656	21,894	0	0	7	221
25-Jun	1,129	23,023	0	0	12	233
26-Jun	890	23,913	0	0	9	242
27-Jun	557	24,470	0	0	6	248
28-Jun	637	25,107	0	0	7	255
29-Jun	2,124	27,231	0	0	23	278
30-Jun	1,627	28,858	0	0	17	295
01-Jul	2,854	31,712	0	0	30	325
02-Jul	3,521	35,232	0	0	37	363
03-Jul	2,821	38,053	0	0	30	393
04-Jul	2,247	40,300	0	0	0	393
05-Jul	3,449	43,749	0	0	0	393
06-Jul	4,183	47,932	0	0	0	393
07-Jul	2,260	50,192	14	14	124	517
08-Jul	2,320	52,512	14	28	128	645
09-Jul	869	53,381	9	37	38	683
10-Jul	738	54,119	10	46	59	742
11-Jul	563	54,682	0	46	33	775
12-Jul	2,907	57,589	0	46	172	947
13-Jul	3,772	61,361	30	76	141	1,087
14-Jul	1,485	62,846	19	95	47	1,135
15-Jul	10,104	72,950	0	95	138	1,272
16-Jul	2,080	75,030	4	99	25	1,298
17-Jul	1,138	76,168	16	115	66	1,364
18-Jul	1,577	77,745	0	115	110	1,474
19-Jul	10,098	87,842	0	115	236	1,710
20-Jul	4,023	91,866	0	115	43	1,753
21-Jul	3,568	95,434	0	115	33	1,786

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Date	Sockeye		Pink		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum
22-Jul	6,406	101,839	58	173	115	1,901
23-Jul	6,915	108,754	45	219	182	2,083
24-Jul	3,310	112,064	0	219	21	2,104
25-Jul	2,869	114,933	32	251	32	2,136
26-Jul	1,363	116,296	15	266	15	2,151
27-Jul	1,111	117,406	34	300	215	2,367
28-Jul	1,420	118,827	43	343	275	2,642
29-Jul	986	119,812	30	374	191	2,833
30-Jul	1,647	121,459	50	424	319	3,153
31-Jul	1,770	123,229	54	478	343	3,496
01-Aug	1,140	124,369	35	513	221	3,717
02-Aug	679	125,049	21	534	132	3,848
03-Aug	390	125,438	12	546	76	3,924
04-Aug	374	125,812	11	557	73	3,996
05-Aug	281	126,093	9	566	54	4,051
06-Aug	247	126,341	8	573	48	4,099
07-Aug	231	126,572	7	581	45	4,144

Appendix A.13. Estimated salmon escapement on the south bank of the Kaslof River, 13 June through 7 August, 1987. Daily fish targets apportioned to species by fish wheel catch.

Date	Sockeye		Pink		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum
13-Jun	611	611	0	0	7	7
14-Jun	466	1,077	0	0	5	12
15-Jun	695	1,772	0	0	7	19
16-Jun	1,514	3,286	0	0	16	35
17-Jun	1,901	5,186	0	0	20	56
18-Jun	1,498	6,684	0	0	16	72
19-Jun	3,263	9,948	0	0	35	106
20-Jun	3,609	13,556	0	0	38	145
21-Jun	2,874	16,431	0	0	31	175
22-Jun	1,205	17,636	0	0	13	188
23-Jun	240	17,876	0	0	3	191
24-Jun	420	18,296	0	0	4	195
25-Jun	509	18,804	0	0	5	201
26-Jun	560	19,364	0	0	6	207
27-Jun	458	19,823	0	0	5	211
28-Jun	511	20,333	0	0	5	217
29-Jun	771	21,104	0	0	8	225
30-Jun	1,027	22,131	0	0	11	236
01-Jul	1,704	23,835	0	0	18	254
02-Jul	3,794	27,629	0	0	40	294
03-Jul	2,304	29,933	0	0	25	319
04-Jul	2,020	31,953	0	0	0	319
05-Jul	2,272	34,225	0	0	0	319
06-Jul	2,773	36,998	0	0	0	319
07-Jul	2,103	39,101	13	13	116	435
08-Jul	2,424	41,525	15	28	133	568
09-Jul	3,255	44,780	32	60	144	712
10-Jul	2,153	46,933	28	88	171	882
11-Jul	1,121	48,053	0	88	66	949
12-Jul	3,088	51,141	0	88	182	1,131
13-Jul	3,002	54,143	24	112	112	1,243
14-Jul	1,481	55,624	19	131	47	1,290
15-Jul	6,683	62,307	0	131	91	1,381
16-Jul	1,140	63,447	2	133	14	1,395
17-Jul	901	64,348	13	146	52	1,447
18-Jul	1,254	65,602	0	146	88	1,535
19-Jul	9,736	75,338	0	146	228	1,763
20-Jul	3,830	79,168	0	146	40	1,803
21-Jul	5,080	84,247	0	146	47	1,851

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Appendix A.13. (p 2 of 2)

Date	Sockeye		Pink		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum
22-Jul	4,608	88,856	42	187	83	1,934
23-Jul	3,527	92,383	23	211	93	2,027
24-Jul	2,011	94,394	0	211	13	2,039
25-Jul	1,015	95,409	11	222	11	2,050
26-Jul	712	96,122	8	230	8	2,058
27-Jul	1,183	97,304	36	266	229	2,288
28-Jul	1,137	98,441	35	301	220	2,508
29-Jul	1,243	99,684	38	339	241	2,749
30-Jul	1,971	101,655	60	399	382	3,131
31-Jul	3,838	105,494	118	517	744	3,875
01-Aug	2,162	107,655	66	583	419	4,295
02-Aug	911	108,566	28	611	177	4,471
03-Aug	661	109,227	20	631	128	4,599
04-Aug	647	109,873	20	651	125	4,725
05-Aug	639	110,513	20	671	124	4,849
06-Aug	577	111,090	18	688	112	4,961
07-Aug	540	111,630	17	705	105	5,065

Appendix A.14. Kasilof River north bank sonar counts by sector, 13 June through 7 August, 1987.

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
13-Jun	357	347	73	12	2	2	35	63	65	61	61	55	1133
14-Jun	581	749	191	42	27	30	66	83	97	105	114	114	2199
15-Jun	755	792	223	30	20	9	62	69	68	53	85	96	2262
16-Jun	1120	1202	173	20	9	8	39	66	52	85	97	125	2996
17-Jun	491	689	169	21	7	1	25	69	53	56	129	162	1872
Total	3304	3779	829	125	65	50	227	350	335	360	486	552	10462
Percent	31.6	36.1	7.9	1.2	0.6	0.5	2.2	3.3	3.2	3.4	4.6	5.3	100.0
18-Jun	705	665	96	8	67	56	14	17	34	44	40	39	1785
19-Jun	1807	1200	126	9	1	0	12	31	43	50	35	42	3356
20-Jun	1192	879	9	17	23	144	80	38	37	39	52	26	2536
21-Jun	735	664	146	13	35	31	52	49	34	45	32	52	1888
22-Jun	185	184	78	19	3	3	44	30	31	50	48	48	723
Total	4624	3592	455	66	129	234	202	165	179	228	207	207	10288
Percent	44.9	34.9	4.4	0.6	1.3	2.3	2.0	1.6	1.7	2.2	2.0	2.0	100.0
23-Jun	95	152	72	40	37	59	47	23	34	54	34	49	696
24-Jun	131	200	75	9	9	14	23	15	35	51	43	59	664
25-Jun	209	363	121	21	9	11	22	33	59	75	96	120	1139
26-Jun	220	297	76	23	12	14	23	24	36	62	41	73	901
27-Jun	155	158	46	9	3	1	9	21	21	31	56	53	563
Total	810	1170	390	102	70	99	124	116	185	273	270	354	3963
Percent	20.4	29.5	9.8	2.6	1.8	2.5	3.1	2.9	4.7	6.9	6.8	8.9	100.0
28-Jun	168	214	53	14	11	1	12	16	30	48	29	48	644
29-Jun	1019	630	128	17	4	0	28	41	79	71	52	78	2147
30-Jun	753	437	105	16	3	4	15	24	66	59	58	104	1644
01-Jul	1900	585	114	18	5	4	11	25	31	55	55	81	2884
02-Jul	2662	493	111	5	2	1	13	37	57	77	23	77	3558
Total	6502	2359	511	70	25	10	79	143	263	310	217	388	10877
Percent	59.8	21.7	4.7	0.6	0.2	0.1	0.7	1.3	2.4	2.9	2.0	3.6	100.0

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Appendix A.14. (p. 2 of 3)

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
03-Jul	2074	470	77	9	16	2	11	13	43	43	33	60	2851
04-Jul	1438	503	82	6	17	4	16	14	36	49	30	53	2248
05-Jul	2504	591	108	13	3		19	30	54	49	29	49	3449
06-Jul	3230	547	97	12	7	1	18	38	81	52	45	48	4176
07-Jul	599	320	120	41	37	32	200	692	247	50	24	38	2400
Total	9845	2431	484	81	80	39	264	787	461	243	161	248	15124
Percent	65.1	16.1	3.2	0.5	0.5	0.3	1.7	5.2	3.0	1.6	1.1	1.6	100.0
08-Jul	429	318	141	35	38	27	201	821	338	60	25	29	2462
09-Jul	371	191	90	30	15	16	30	52	31	36	20	26	908
10-Jul	365	168	66	15	12	18	28	45	26	22	23	16	804
11-Jul	257	145	65	13	3	0	16	35	25	14	6	17	596
12-Jul	1642	977	289	47	7	2	16	34	31	13	9	11	3078
Total	3064	1799	651	140	75	63	291	987	451	145	83	99	7848
Percent	39.0	22.9	8.3	1.8	1.0	0.8	3.7	12.6	5.7	1.8	1.1	1.3	100.0
13-Jul	1768	1255	519	92	7	4	26	61	96	63	23	29	3943
14-Jul	791	377	170	24	2	3	38	34	40	41	15	16	1551
15-Jul	8719	1156	204	14	2	0	29	32	29	18	10	29	10242
16-Jul	1273	420	195	35	5	3	27	48	38	25	15	24	2108
17-Jul	520	241	162	48	29	43	42	37	32	26	17	21	1218
Total	13071	3449	1250	213	45	53	162	212	235	173	80	119	19062
Percent	68.6	18.1	6.6	1.1	0.2	0.3	0.8	1.1	1.2	0.9	0.4	0.6	100.0
18-Jul	776	336	177	90	62	49	29	41	40	26	20	35	1681
19-Jul	8450	1263	276	85	43	10	31	51	51	34	11	28	10333
20-Jul	3040	583	171	77	24	1	15	40	51	15	21	28	4066
21-Jul	2513	608	143	85	72	52	13	29	42	10	8	4	3579
22-Jul	4748	1451	228	54	31	5	8	9	32	10	2	1	6579
Total	19527	4241	995	391	232	117	96	170	216	95	62	96	26238
Percent	74.4	16.2	3.8	1.5	0.9	0.4	0.4	0.6	0.8	0.4	0.2	0.4	100.0

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Appendix A.14. (p. 3 of 3)

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
23-Jul	5744	1077	191	31	12	2	2	14	8	11	22	28	7142
24-Jul	2701	508	84	11	3	0	3	1	12	5	1		3329
25-Jul	2112	691	64	5	2	20	3	4	11	11	7	3	2933
26-Jul	931	355	71	9	2	1	0	3	9	5	5	2	1393
27-Jul	1015	251	74	1	0	0	0	3	12	2	2		1360
Total	12503	2882	484	57	19	23	8	25	52	34	37	33	16157
Percent	77.4	17.8	3.0	0.4	0.1	0.1	0.0	0.2	0.3	0.2	0.2	0.2	100.0
28-Jul	1386	242	80	4	5	0	3	1	7	2	3	6	1739
29-Jul	976	149	50	5	3	1	2	2	4	7	6	2	1207
30-Jul	1722	206	36	3	0	4	0	0	3	8	20	15	2017
31-Jul	1845	157	29	3	2	2	2	0	2	7	65	53	2167
01-Aug	1329	97	16	4	1	0	0	1	1	2	30	33	1514
Total	7258	851	211	19	11	7	7	4	17	26	124	109	8644
Percent	84.0	9.8	2.4	0.2	0.1	0.1	0.1	0.0	0.2	0.3	1.4	1.3	100.0
02-Aug	656	57	16	2	2	0	1	2	4	3	48	41	832
03-Aug	297	39	11	1	5	0	0	0	0	6	63	55	477
04-Aug	232	32	12	3	5	0	1	3	2	3	83	82	458
05-Aug	152	31	15	6	2	0	0	0	0	2	58	78	344
06-Aug	140	31	14	2	2	0	0	0	0	2	42	70	303
07-Aug	132	26	21	2	1	0	1	1	0	1	35	63	283
Total	1609	216	89	16	17	0	3	6	6	17	329	389	2697
Percent	59.7	8.0	3.3	0.6	0.6	0.0	0.1	0.2	0.2	0.6	12.2	14.4	100.0

Appendix A.15. Kasilof River south bank sonar counts by sector, 13 June through 7 August, 1987.

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
13-Jun	66	31	61	50	30	19	22	34	61	89	86	91	640
14-Jun	19	59	64	19	4	0	11	21	44	87	67	73	468
15-Jun	21	114	98	35	7	4	8	7	59	143	106	118	720
16-Jun	98	503	285	104	33	9	29	36	74	113	113	119	1516
17-Jun	156	655	285	151	38	16	37	27	77	213	131	135	1921
Total	360	1362	793	359	112	48	107	125	315	645	503	536	5265
Percent	6.8	25.9	15.1	6.8	2.1	0.9	2.0	2.4	6.0	12.3	9.6	10.2	100.0
18-Jun	179	543	186	78	28	10	31	30	84	152	116	77	1514
19-Jun	571	1513	448	130	28	7	44	52	89	163	126	127	3298
20-Jun	695	1764	469	115	43	7	53	61	101	167	110	115	3700
21-Jun	304	1207	480	121	31	12	59	40	108	225	152	166	2905
22-Jun	202	478	174	35	13	6	11	14	33	60	117	74	1217
Total	1951	5505	1757	479	143	42	198	197	415	767	621	559	12634
Percent	15.4	43.6	13.9	3.8	1.1	0.3	1.6	1.6	3.3	6.1	4.9	4.4	100.0
23-Jun	4	21	27	5	5	2	2	5	12	51	49	51	234
24-Jun	1	44	49	19	1	1	6	5	15	42	135	105	423
25-Jun	58	110	62	11	3	1	5	5	14	42	113	91	515
26-Jun	8	101	116	18	3	4	2	7	9	28	196	74	566
27-Jun	11	64	38	8	5	1	1	2	10	26	188	105	459
Total	82	340	292	61	17	9	16	24	60	189	681	426	2197
Percent	3.7	15.5	13.3	2.8	0.8	0.4	0.7	1.1	2.7	8.6	31.0	19.4	100.0
28-Jun	7	75	49	9	0	0	2	4	8	41	223	98	516
29-Jun	22	272	157	19	5	1	6	14	5	29	192	57	779
30-Jun	48	499	172	25	1	0	4	8	14	29	167	71	1038
01-Jul	118	954	296	40	3	4	6	13	21	35	162	69	1721
02-Jul	377	2459	608	61	6	2	10	19	30	64	131	67	3834
Total	572	4259	1282	154	15	7	28	58	78	198	875	362	7888
Percent	7.3	54.0	16.3	2.0	0.2	0.1	0.4	0.7	1.0	2.5	11.1	4.6	100.0

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Appendix A.15. (p 2 of 3).

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
03-Jul	282	1234	449	45	7	0	12	22	14	47	149	68	2329
04-Jul	449	910	356	54	4	2	11	15	48	86	162	98	2195
05-Jul	428	1163	430	46	4	3	10	25	17	21	80	45	2272
06-Jul	258	1593	641	61	7	2	9	12	22	32	90	46	2773
07-Jul	335	1423	370	20	1	1	5	9	5	13	30	20	2232
Total	1752	6323	2246	226	23	8	47	83	106	199	511	277	11801
Percent	14.8	53.6	19.0	1.9	0.2	0.1	0.4	0.7	0.9	1.7	4.3	2.3	100.0
08-Jul	361	691	474	140	53	29	117	109	193	187	101	116	2571
09-Jul	904	663	657	212	66	24	172	143	188	174	96	126	3425
10-Jul	471	454	477	136	43	12	94	94	152	157	123	139	2352
11-Jul	262	216	220	102	36	12	39	40	77	85	37	61	1187
12-Jul	588	775	791	300	89	33	111	115	155	137	85	91	3270
Total	2586	2799	2619	890	287	110	533	501	765	740	442	533	12805
Percent	20.2	21.9	20.5	7.0	2.2	0.9	4.2	3.9	6.0	5.8	3.5	4.2	100.0
13-Jul	214	548	892	374	91	18	194	193	240	158	93	123	3138
14-Jul	221	350	337	93	14	7	80	70	108	118	58	96	1552
15-Jul	2134	2432	1410	205	19	6	83	78	133	107	68	99	6774
16-Jul	283	546	515	95	26	4	82	78	150	180	121	150	2230
17-Jul	203	229	184	23	10	3	26	28	52	70	55	83	966
Total	3055	4105	3338	790	160	38	465	447	683	633	395	551	14660
Percent	20.8	28.0	22.8	5.4	1.1	0.3	3.2	3.0	4.7	4.3	2.7	3.8	100.0
18-Jul	440	327	251	20	3	2	36	35	86	60	40	41	1341
19-Jul	6321	1873	874	96	18	0	84	107	158	176	126	134	9967
20-Jul	1866	896	566	61	8	0	46	56	99	110	67	93	3868
21-Jul	2679	1411	667	58	9	1	44	40	65	67	42	45	5128
22-Jul	2817	1299	279	20	0	1	24	25	82	63	31	90	4731
Total	14123	5806	2637	255	38	4	234	263	490	476	306	403	25035
Percent	56.4	23.2	10.5	1.0	0.2	0.0	0.9	1.1	2.0	1.9	1.2	1.6	100.0

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Appendix A.15. (p 3 of 3)

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
23-Jul	1665	1223	403	36	24	23	16	20	30	68	69	66	3643
24-Jul	381	785	298	23	1	2	26	43	86	97	178	98	2018
25-Jul	115	199	242	50	10	11	37	44	74	82	93	84	1041
26-Jul	97	155	112	16	5	3	22	25	53	67	80	78	713
27-Jul	167	408	230	59	5	0	19	38	72	154	155	141	1448
Total	2425	2770	1285	184	45	39	120	170	315	468	575	467	8863
Percent	27.4	31.3	14.5	2.1	0.5	0.4	1.4	1.9	3.6	5.3	6.5	5.3	100.0
28-Jul	220	471	220	32	5	0	9	16	33	71	80	235	1392
29-Jul	328	551	245	16	1	0	10	15	20	66	95	176	1523
30-Jul	735	897	201	15	0	0	18	59	42	84	127	236	2414
31-Jul	2057	2004	303	35	2	0	16	42	35	54	59	93	4700
01-Aug	1152	1183	149	2	2	0	9	14	16	38	35	47	2647
Total	4492	5106	1118	100	10	0	62	146	146	313	396	787	12676
Percent	35.4	40.3	8.8	0.8	0.1	0.0	0.5	1.2	1.2	2.5	3.1	6.2	100.0
02-Aug	425	390	93	6	1	0	6	32	22	31	41	67	1114
03-Aug	292	261	45	3	1	1	4	41	23	42	29	67	809
04-Aug	149	271	79	9	2	0	16	31	35	57	62	91	802
05-Aug	280	222	60	4	1	1	11	17	41	45	39	56	777
06-Aug	347	183	30	9	2	1	5	15	17	40	26	28	703
07-Aug	330	143	16	7	2	0	3	15	21	27	33	63	660
Total	1823	1470	323	38	9	3	45	151	159	242	230	372	4865
Percent	37.5	30.2	6.6	0.8	0.2	0.1	0.9	3.1	3.3	5.0	4.7	7.6	100.0

Appendix A.16. Kasilof River north bank sonar counts by hour, 13 June through 7 August, 1987.

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
13-Jun	100	118	63	25	26	23	47	34	11	29	40	42	41	29	39	10	17	13	15	23	38	124	136	90
14-Jun	173	130	117	63	64	31	29	142	93	52	31	46	54	36	38	22	15	25	21	19	34	240	427	297
15-Jun	290	210	139	71	50	40	47	28	104	41	27	16	30	30	34	28	34	41	48	46	71	283	350	204
16-Jun	166	109	130	72	81	53	77	43	111	70	101	84	79	125	104	115	105	118	130	125	121	155	364	358
17-Jun	227	145	162	96	42	48	60	68	41	60	38	49	78	60	82	62	93	65	20	20	21	40	57	238
18-Jun	137	103	129	73	41	38	62	50	17	20	16	91	158	128	54	47	38	47	40	43	48	95	73	237
19-Jun	267	238	172	143	98	111	108	98	95	97	73	70	93	192	190	160	126	125	153	142	199	152	140	114
20-Jun	240	309	193	135	154	117	103	94	66	117	69	69	72	79	44	189	120	110	109	70	41	36	79	51
21-Jun	82	127	177	148	111	53	70	88	79	39	40	55	24	62	26	66	138	133	105	78	75	45	31	36
22-Jun	55	43	80	56	20	34	12	25	31	21	8	19	23	18	11	21	46	32	31	37	36	25	20	19
23-Jun	36	30	55	44	41	65	66	65	12	23	21	9	8	13	16	7	16	25	18	34	34	15	18	25
24-Jun	17	19	35	42	43	13	13	38	30	32	28	31	31	29	14	21	14	17	30	25	31	43	43	25
25-Jun	40	25	32	28	23	17	19	38	55	68	61	34	53	44	46	34	36	107	97	81	47	55	43	56
26-Jun	29	38	37	39	25	50	55	44	38	36	45	32	28	39	44	31	53	30	32	59	34	28	24	31
27-Jun	65	57	46	21	23	15	21	17	18	22	17	23	21	19	14	12	11	9	15	32	21	26	11	27
28-Jun	20	17	20	17	20	29	36	21	36	19	42	36	29	35	20	31	28	38	17	30	24	29	24	26
29-Jun	65	58	50	58	56	74	102	128	90	52	51	49	65	81	58	93	137	126	118	119	158	202	97	60
30-Jun	72	165	134	74	98	63	41	50	70	103	61	26	43	87	68	32	26	49	73	57	50	43	87	72
01-Jul	40	105	105	101	73	31	39	62	52	80	125	100	107	173	191	67	105	114	224	196	145	303	260	86
02-Jul	88	75	158	148	180	131	104	112	101	79	143	142	171	42	103	203	153	185	108	146	201	250	249	286
03-Jul	130	103	97	135	133	81	91	64	88	92	93	96	143	116	128	72	110	109	148	168	141	136	151	226
04-Jul	135	115	114	109	94	58	25	26	27	37	26	40	68	60	80	124	168	228	196	65	111	105	151	86

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Appendix Table A.16. (p 2 of 3)

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
05-Jul	86	125	107	126	94	57	38	25	24	20	60	42	64	56	184	306	196	251	481	237	303	229	206	132
06-Jul	171	143	98	96	75	114	111	75	75	79	71	36	77	331	374	353	300	289	233	278	299	192	174	132
07-Jul	104	128	113	74	81	61	54	38	23	39	102	56	192	121	136	154	147	34	29	178	243	113	126	54
08-Jul	59	97	117	62	22	43	130	140	160	80	105	25	174	179	172	135	183	151	61	50	87	60	83	87
09-Jul	77	63	55	35	36	21	19	28	16	30	8	16	26	17	8	17	27	81	47	21	51	66	84	59
10-Jul	71	81	76	85	46	22	41	41	16	19	13	5	9	22	18	14	19	17	65	47	30	27	14	6
11-Jul	26	24	28	11	10	18	2	4	17	22	5	26	24	13	21	10	30	23	22	25	15	56	73	91
12-Jul	86	47	18	64	102	386	242	77	264	324	137	238	191	90	91	76	52	80	83	163	87	84	51	45
13-Jul	67	75	81	89	128	118	678	91	38	165	171	227	265	269	182	62	102	88	93	166	280	193	171	144
14-Jul	77	70	45	48	21	33	22	23	34	20	23	35	41	37	27	46	22	26	37	16	179	157	231	281
15-Jul	221	140	140	157	186	365	731	718	1368	437	58	471	722	869	505	213	531	357	277	292	562	639	199	84
16-Jul	162	247	217	139	98	41	53	67	42	85	72	34	13	23	44	72	72	78	75	70	45	72	152	135
17-Jul	100	88	49	87	76	45	46	48	37	16	16	98	61	31	49	44	26	49	41	44	23	48	48	48
18-Jul	78	45	31	38	71	40	28	47	50	66	66	37	150	56	66	47	100	95	96	63	54	80	74	203
19-Jul	194	67	87	127	236	118	213	182	120	249	463	593	291	556	953	590	355	658	761	787	1082	149	772	730
20-Jul	523	320	178	128	173	287	242	268	183	101	103	134	152	116	115	108	198	157	110	107	97	97	83	86
21-Jul	130	88	69	93	138	78	85	59	68	39	41	144	144	313	350	359	265	306	187	151	113	109	122	128
22-Jul	130	136	219	200	277	287	195	162	233	242	121	217	193	187	178	292	338	622	632	501	238	248	350	381
23-Jul	346	310	252	422	498	508	543	350	447	506	302	346	335	219	109	166	163	206	218	211	172	118	179	216
24-Jul	146	91	97	83	105	170	181	149	108	152	154	119	108	159	135	136	119	148	268	243	115	96	118	129
25-Jul	168	68	80	103	90	132	206	200	147	165	251	140	133	109	125	104	93	51	90	160	132	88	64	34
26-Jul	36	35	38	38	30	22	62	94	77	46	40	23	45	80	39	71	89	51	64	87	117	89	56	64

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Appendix Table A.16. (p 3 of 3)

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
27-Jul	47	47	42	57	46	36	38	80	62	36	19	34	44	37	57	56	52	51	111	89	89	63	73	94
28-Jul	126	94	83	80	70	75	73	188	222	97	49	79	56	71	61	33	11	10	27	30	45	69	45	45
29-Jul	33	37	45	26	18	23	18	20	87	72	51	36	60	19	33	46	61	62	64	79	41	141	63	72
30-Jul	68	54	51	60	45	62	76	35	49	84	73	58	46	112	78	95	130	111	91	104	160	204	101	70
31-Jul	60	63	41	59	40	56	53	45	40	33	73	107	87	171	232	137	141	170	116	85	87	75	129	67
01-Aug	63	35	51	45	38	58	66	82	77	65	68	112	111	72	63	56	48	74	56	45	63	42	62	62
02-Aug	39	19	21	26	33	29	34	33	31	32	40	36	37	65	44	56	51	45	33	40	31	26	16	15
03-Aug	19	18	8	14	17	29	14	15	23	17	17	15	19	18	25	26	18	25	23	22	25	34	18	18
04-Aug	14	19	17	12	9	22	26	24	20	22	6	17	15	17	22	20	16	26	18	19	27	25	24	21
05-Aug	12	7	6	16	17	14	21	30	13	21	14	12	17	21	14	11	20	16	12	13	7	13	12	5
06-Aug	6	15	12	7	6	23	15	8	10	7	8	8	2	18	15	12	19	15	18	18	13	17	17	14
07-Aug	11	12	7	15	16	6	16	7	8	13	9	6	13	11	10	18	13	15	15	11	13	20	10	8

Percent ^a	5.1	4.7	4.4	3.8	3.5	3.5	3.9	3.8	3.7	3.5	3.1	3.3	3.9	4.1	4.0	3.9	4.2	4.5	4.5	4.4	4.6	5.2	5.3	5.2
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^a Percentages weighted by daily escapement.

Appendix A.17. Kasilof River south bank sonar counts by hour, 13 June through 7 August, 1987.

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
13-Jun	30	35	39	40	25	25	22	24	19	32	20	34	41	31	17	33	16	22	18	16	19	25	19	38
14-Jun	51	61	34	33	15	12	19	22	18	16	10	14	24	7	7	13	18	14	9	10	4	17	19	21
15-Jun	96	54	39	24	10	24	52	16	27	37	13	18	4	11	16	10	11	22	17	18	20	43	60	78
16-Jun	117	113	103	95	38	31	36	27	19	64	35	16	27	37	44	47	57	38	78	46	64	63	118	203
17-Jun	196	239	243	152	68	57	33	56	41	36	26	82	84	86	52	55	69	30	22	43	27	40	58	126
18-Jun	219	236	154	85	31	37	27	38	25	20	23	25	67	50	22	22	23	38	33	37	37	47	81	137
19-Jun	332	566	300	135	47	34	58	156	106	62	55	32	61	125	162	94	67	53	66	81	113	145	181	267
20-Jun	635	790	439	251	134	93	76	77	39	48	33	39	29	32	69	75	85	93	33	76	84	125	121	224
21-Jun	197	290	430	212	88	46	79	123	86	74	127	75	92	63	48	74	138	129	95	142	94	46	95	62
22-Jun	163	272	174	138	56	22	42	27	40	35	24	23	9	43	14	4	14	17	9	10	22	18	14	27
23-Jun	7	13	15	11	12	4	6	4	6	6	2	2	12	10	2	12	8	12	12	5	23	17	19	14
24-Jun	27	22	26	27	23	16	11	9	14	12	15	8	16	14	14	14	6	14	23	14	20	28	25	25
25-Jun	30	22	21	29	49	47	11	30	25	36	15	10	8	12	9	9	11	9	16	12	19	18	34	33
26-Jun	40	59	41	27	29	41	37	15	17	12	8	14	10	20	9	9	15	13	18	17	36	28	26	25
27-Jun	19	29	22	18	20	26	14	25	22	13	14	24	14	17	18	45	9	6	33	12	17	8	16	18
28-Jun	26	29	27	22	14	18	17	31	25	11	11	16	17	22	18	27	19	23	20	15	14	34	27	33
29-Jun	70	52	40	45	43	22	32	45	27	22	20	20	12	10	10	12	15	10	3	9	44	89	61	66
30-Jun	107	107	99	69	38	22	27	24	30	19	17	11	13	9	25	9	6	16	21	21	13	85	131	119
01-Jul	59	77	89	76	40	32	27	29	34	48	25	28	30	36	26	54	83	72	103	88	107	160	262	136
02-Jul	101	183	211	216	178	195	166	149	149	126	133	165	163	102	91	149	185	169	156	241	207	107	155	137
03-Jul	124	167	150	127	74	59	36	54	47	62	73	60	35	82	67	114	90	73	69	121	99	205	155	186
04-Jul	168	149	133	107	82	37	22	19	56	63	54	19	50	79	123	88	132	116	80	161	117	70	100	170

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Appendix A.17. (p 2 of 3)

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
05-Jul	181	114	92	119	77	48	31	19	33	19	9	14	30	45	72	47	61	123	143	241	281	191	190	92
06-Jul	95	137	117	112	79	48	27	99	125	75	91	99	105	46	160	221	114	85	91	253	219	161	103	111
07-Jul	82	86	126	111	52	40	33	40	42	40	68	95	79	84	87	189	226	118	98	113	130	111	102	80
08-Jul	78	158	151	96	80	65	43	91	54	108	45	42	46	64	56	107	113	177	108	129	159	171	210	220
09-Jul	182	187	170	218	262	151	102	78	67	55	61	61	74	49	78	119	124	143	148	75	209	347	243	222
10-Jul	157	190	185	197	187	115	129	102	51	57	44	33	46	43	44	67	47	121	142	96	93	88	65	53
11-Jul	19	29	42	22	28	48	32	42	94	98	103	65	15	36	30	32	27	34	37	33	53	80	100	88
12-Jul	93	107	86	83	106	454	398	65	178	207	126	110	127	118	109	97	65	44	62	175	110	87	142	121
13-Jul	113	141	138	117	72	59	301	212	116	332	292	185	172	150	77	58	50	48	49	54	143	101	87	71
14-Jul	70	99	70	49	40	16	28	27	43	10	36	35	51	58	27	41	17	23	40	36	153	166	213	204
15-Jul	173	135	94	66	68	105	319	379	656	311	59	137	261	377	323	353	631	598	483	277	283	447	139	100
16-Jul	137	208	154	137	109	98	64	55	43	48	178	128	66	109	124	89	79	59	61	56	109	47	36	36
17-Jul	23	22	24	46	48	39	36	35	45	31	32	49	61	33	40	62	46	46	51	47	42	34	33	41
18-Jul	54	43	50	35	46	39	53	39	38	23	52	50	95	78	36	44	93	86	72	59	71	39	39	107
19-Jul	194	106	116	213	231	422	346	412	398	443	502	567	1146	1546	451	231	156	178	120	130	418	714	507	420
20-Jul	574	389	218	121	160	336	411	234	255	173	114	115	85	48	70	82	74	68	54	35	36	75	81	60
21-Jul	92	98	107	107	173	305	356	113	243	349	331	250	214	347	250	237	297	356	158	40	103	172	242	188
22-Jul	161	205	215	407	403	477	288	210	273	239	192	218	151	168	121	95	125	238	125	82	22	86	136	94
23-Jul	72	48	89	123	250	499	459	347	285	272	174	150	78	41	82	57	66	76	189	132	35	52	32	35
24-Jul	23	62	61	71	104	202	142	156	99	117	129	90	101	63	40	54	83	51	87	83	54	47	63	36
25-Jul	37	36	40	32	56	94	136	55	39	41	29	36	42	43	35	31	31	28	42	42	32	29	31	24
26-Jul	22	34	27	34	30	31	36	34	30	21	30	14	26	22	30	16	20	37	19	36	32	41	52	39

- Continued -

Appendix A.17. (p 3 of 3)

Counts by Hour

Date	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
27-Jul	59	31	31	55	80	92	79	107	96	78	56	54	45	31	29	39	55	37	63	45	84	62	54	86
28-Jul	72	66	71	64	76	73	50	70	144	64	40	36	21	28	86	23	36	43	38	27	65	73	69	57
29-Jul	56	41	47	66	80	95	82	106	137	126	87	46	38	67	35	37	46	48	34	33	43	81	46	46
30-Jul	41	47	68	46	45	77	88	60	171	158	93	90	78	104	116	80	123	118	134	109	171	257	109	31
31-Jul	43	46	82	29	55	84	191	108	108	160	501	925	500	260	134	250	138	31	125	168	231	197	211	123
01-Aug	64	61	80	71	100	128	278	188	267	208	182	162	179	105	59	109	83	39	49	52	40	54	61	28
02-Aug	25	22	28	16	7	14	54	62	48	62	38	64	63	90	91	63	44	52	40	52	56	59	41	23
03-Aug	12	15	5	12	12	12	32	36	37	56	27	37	51	60	63	75	46	42	30	30	35	33	25	26
04-Aug	14	12	21	18	20	17	45	23	31	46	2	22	36	41	27	59	44	47	46	65	43	67	28	28
05-Aug	15	11	25	23	42	46	36	39	36	25	15	19	44	28	33	30	44	45	40	51	39	27	42	22
06-Aug	20	15	13	20	16	18	28	33	36	25	21	21	32	36	27	26	31	50	44	43	38	47	47	16
07-Aug	15	14	26	16	17	16	23	33	27	28	47	31	39	20	34	44	42	30	27	31	25	38	22	15

Percent^a 5.3 5.9 5.2 4.4 3.8 4.1 4.4 3.9 4.2 4.0 3.4 3.5 3.7 3.7 3.2 3.6 3.5 3.6 3.6 3.7 4.3 5.0 5.0 4.9

^a Percentages weighted by daily escapement.

Appendix A.18. Daily adjusted fish wheel catch by species for the Kaslof River, 30 June through 6 August 1987.

Date	Hours Open ^a	Sockeye		Pink		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum
30-Jun	17.50	0	0	0	0	0	0
01-Jul	26.50	36	36	0	0	0	0
02-Jul	22.50	83	119	0	0	2	2
03-Jul	22.50	68	187	0	0	0	2
04-Jul	24.50	31	218	0	0	0	2
05-Jul	23.50	45	263	0	0	0	2
06-Jul	28.00	82	345	0	0	0	2
07-Jul	20.00	133	478	0	0	2	4
08-Jul	25.50	194	672	2	2	16	20
09-Jul	19.00	204	876	2	4	9	29
10-Jul	24.00	227	1,103	3	7	18	47
11-Jul	22.50	77	1,180	0	7	9	56
12-Jul	24.50	194	1,374	0	7	7	63
13-Jul	14.50	375	1,749	3	10	14	77
14-Jul	7.00	157	1,906	2	12	5	82
15-Jul	12.00	514	2,420	0	12	7	89
16-Jul	6.00	1,156	3,576	2	14	14	103
17-Jul	15.00	276	3,852	4	18	16	119
18-Jul	11.50	157	4,009	0	18	11	130
19-Jul	7.00	342	4,351	0	18	8	138
20-Jul	16.50	284	4,635	0	18	3	141
21-Jul	12.30	321	4,956	0	18	3	144
22-Jul	12.25	222	5,178	2	20	4	148
23-Jul	21.40	304	5,482	2	22	8	156
24-Jul	25.00	160	5,642	0	22	1	157
25-Jul	21.50	105	5,747	1	23	1	158
26-Jul	54.30	74	5,821	1	24	1	159
27-Jul	0.00	0	5,821	0	24	0	159
28-Jul	43.30	43	5,864	0	24	3	162
29-Jul	0.00	0	5,864	0	24	0	162
30-Jul	45.10	23	5,887	1	25	2	164
31-Jul	0.00	0	5,887	0	25	0	164
01-Aug	24.00	13	5,900	0	25	3	167
02-Aug	24.00	8	5,908	2	27	4	171
03-Aug	24.30	5	5,913	0	27	2	173
04-Aug	23.60	4	5,917	0	27	2	175
05-Aug ^b	24.30	1	5,918	0	27	1	176
06-Aug ^b	23.00	1	5,919	0	27	2	178

^a Fish wheel catch adjusted for 24 h: (daily catch * 24 h)/hours open.

^b Actual total catch by species: 3910 sockeye salmon; 20 pink salmon; 136 chinook salmon.

Appendix A.19. Length composition of the major age classes of sockeye salmon in the Kaslof River, 1980-87. Length measured from mid-eye to fork of tail.

Year	Age Class	Male			Female			Total			Ratio Male/ Female
		Ave Length (mm)	Stndrd Error	Sample Size	Ave Length (mm)	Stndrd Error	Sample Size	Ave Length (mm)	Stndrd Error	Sample Size	
1980	1.2	474	2.4	189	464	1.2	376	467		565	0.5:1
1981		503	2.0	241	492	2.5	146	499		387	1.7:1
1982		481	2.2	285	466	1.8	235	474	2.0	475	1.2:1
1983		493	1.9	113	491	2.5	78	492	1.5	191	1.4:1
1984		480	1.2	544	478	1.1	428	479	0.8	972	2.6:1
1985		474	0.8	723	472	0.6	897	473	0.5	1620	0.8:1
1986		482	1.7	266	482	1.4	368	482	1.1	634	0.7:1
1987		472	1.7	282	470	1.5	257	471	1.2	539	1.1:1
1980	1.3	531	6.8	35	516	2.4	115	520		150	0.3:1
1981		566	1.2	422	558	1.4	369	562		791	1.1:1
1982		549	1.4	377	542	1.1	428	545	1.2	805	0.9:1
1983		558	1.9	170	547	1.9	187	552	1.3	357	0.9:1
1984		539	1.4	304	533	1.3	383	535	0.9	687	0.8:1
1985		531	1.5	341	527	1.1	433	529	0.9	774	0.8:1
1986		550	1.8	342	543	1.3	405	546	1.1	747	0.8:1
1987		553	2.2	191	552	2.3	154	552	1.6	345	1.2:1
1982	2.2	479	3.2	65	472	2.7	81	475	2.9	146	0.8:1
1984		484	1.8	202	482	1.4	223	483	1.1	425	0.9:1
1985		482	1.5	248	476	1.2	319	479	0.9	567	0.8:1
1986		492	4.1	78	489	2.1	115	490	2.1	193	0.7:1
1987		478	2.3	137	475	2.3	141	476	1.7	278	1.0:1
1982	2.3	548	4.3	41	543	3.8	40	546	4.1	86	1.0:1
1984		533	2.6	102	526	3.0	80	530	2.0	182	1.3:1

Appendix A.20. Weight composition of the major age classes of sockeye salmon in the Kaslof River, 1981-87.

Year	Age Class	Male			Female			Total		
		Ave Weight (Kg)	Stndrd Error	Sample Size	Ave Weight (Kg)	Stndrd Error	Sample Size	Ave Weight (Kg)	Stndrd Error	Sample Size
1981	1.2	2.2	0.05	241	1.9	0.03	146	2.1	0.03	387
1982		1.8	0.03	235	1.5	0.02	240	1.7	0.03	475
1983		2.04	0.06	113	1.84	0.03	78	1.96	0.04	191
1984		1.86	0.03	101	1.81	0.04	39	1.85	0.02	140
1985		1.77	0.02	141	1.64	0.02	122	1.70	0.01	263
1986		2.11	0.09	30	1.84	0.12	13	1.95	0.07	43
1987		1.70	0.03	101	2.05	0.42	95	1.87	0.21	196
1981	1.3	3.0	0.04	422	2.9	0.03	369	3.0	0.02	791
1982		2.7	0.02	377	2.4	0.02	428	2.6	0.02	805
1983		2.78	0.03	168	2.47	0.02	187	2.62	0.02	355
1984		2.67	0.03	146	2.53	0.03	182	2.59	0.02	328
1985		2.51	0.04	80	2.27	0.02	113	2.38	0.02	193
1986		2.68	0.02	235	2.49	0.03	203	2.58	0.02	438
1987		2.83	0.04	105	2.70	0.03	109	2.76	0.02	214
1981	2.2	2.3	0.08	40	2.0	0.07	33	2.2	0.04	73
1982		1.7	0.05	65	1.6	0.04	81	1.7	0.06	146
1984		2.07	0.10	31	1.79	0.05	27	1.95	0.06	58
1985		1.79	0.04	46	1.63	0.03	64	1.70	0.02	110
1986		1.96	0.11	23	1.90	0.08	17	1.92	0.07	40
1987		1.73	0.04	52	1.79	0.05	41	1.76	0.03	93
1982	2.3	2.6	0.07	41	2.3	0.05	34	2.5	0.06	75
1984		2.72	0.10	32	2.63	0.14	31	2.68	0.09	63

Appendix A.21. Estimated salmon escapement into the Crescent River, north and south banks combined, 1 July through 7 August, 1987. Daily fish targets apportioned to species by gill net catch.

Date	Sockeye		Pink		Chum		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
01-Jul	1,401	1,401	8	8	8	8	8	8	8	8
02-Jul	520	1,922	3	11	3	11	3	11	3	11
03-Jul	461	2,383	3	14	3	14	3	14	3	14
04-Jul	386	2,768	2	16	2	16	2	16	2	16
05-Jul	384	3,152	2	19	2	19	2	19	2	19
06-Jul	3,788	6,940	23	41	23	41	23	41	23	41
07-Jul	3,025	9,965	18	60	18	60	18	60	18	60
08-Jul	3,348	13,313	20	80	20	80	20	80	20	80
09-Jul	5,726	19,039	34	114	34	114	34	114	34	114
10-Jul	3,888	22,928	23	138	23	138	23	138	23	138
11-Jul	5,967	28,895	36	174	36	174	36	174	36	174
12-Jul	3,111	32,006	19	192	19	192	19	192	19	192
13-Jul	4,302	36,308	26	218	26	218	26	218	26	218
14-Jul	3,325	39,633	20	238	20	238	20	238	20	238
15-Jul	4,346	43,979	26	264	26	264	26	264	26	264
16-Jul	1,925	45,904	12	276	12	276	12	276	12	276
17-Jul	2,315	48,219	14	290	14	290	14	290	14	290
18-Jul	5,078	53,297	31	321	31	321	31	321	31	321
19-Jul	7,650	60,946	46	367	46	367	46	367	46	367
20-Jul	4,209	65,155	25	392	25	392	25	392	25	392
21-Jul	5,333	70,488	32	424	32	424	32	424	32	424
22-Jul	9,263	79,750	56	480	56	480	56	480	56	480
23-Jul	12,151	91,902	73	553	73	553	73	553	73	553
24-Jul	5,528	97,429	291	844	1,309	1,862	0	553	0	553
25-Jul	4,332	101,761	228	1,072	1,026	2,888	0	553	0	553
26-Jul	2,521	104,283	133	1,205	597	3,486	0	553	0	553
27-Jul	1,915	106,197	101	1,306	453	3,939	0	553	0	553
28-Jul	1,357	107,554	71	1,377	321	4,260	0	553	0	553
29-Jul	1,228	108,783	65	1,442	291	4,551	0	553	0	553
30-Jul	579	109,362	30	1,472	137	4,689	0	553	0	553
31-Jul	2,161	111,523	114	1,586	512	5,200	0	553	0	553
01-Aug	2,615	114,138	138	1,724	619	5,820	0	553	0	553
02-Aug	1,745	115,883	92	1,815	413	6,233	0	553	0	553
03-Aug	1,265	117,147	67	1,882	300	6,532	0	553	0	553
04-Aug	983	118,130	52	1,934	233	6,765	0	553	0	553
05-Aug	306	118,436	16	1,950	73	6,838	0	553	0	553
06-Aug	460	118,896	24	1,974	109	6,947	0	553	0	553
07-Aug	1,322	120,218	70	2,044	313	7,260	0	553	0	553

Appendix A.22. Daily gill net catch by species for the Crescent River, 9 July through 7 August, 1987.

	Sockeye		Pink		Chum		Coho		Chinook	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
08-Jul	10	10	0	0	0	0	0	0	0	0
09-Jul	0	10	0	0	0	0	0	0	0	0
10-Jul	10	20	0	0	0	0	0	0	0	0
11-Jul	0	20	0	0	0	0	0	0	0	0
12-Jul	0	20	0	0	0	0	0	0	0	0
13-Jul	0	20	0	0	0	0	0	0	0	0
14-Jul	27	47	1	1	0	0	0	0	0	0
15-Jul	15	62	0	1	0	0	0	0	0	0
16-Jul	0	62	0	1	0	0	0	0	0	0
17-Jul	6	68	0	1	0	0	0	0	0	0
18-Jul	0	68	0	1	0	0	0	0	0	0
19-Jul	17	85	0	1	0	0	0	0	0	0
20-Jul	0	85	0	1	0	0	0	0	0	0
21-Jul	11	96	0	1	0	0	0	0	0	0
22-Jul	19	115	0	1	1	1	0	0	0	0
23-Jul	50	165	0	1	0	1	1	1	1	1
24-Jul	0	165	0	1	0	1	0	1	0	1
25-Jul	0	165	0	1	0	1	0	1	0	1
26-Jul	10	175	0	1	0	1	0	1	0	1
27-Jul	0	175	0	1	0	1	0	1	0	1
28-Jul	0	175	0	1	0	1	0	1	0	1
29-Jul	1	176	0	1	0	1	0	1	0	1
30-Jul	0	176	0	1	0	1	0	1	0	1
31-Jul	19	195	0	1	0	1	0	1	0	1
01-Aug	0	195	0	1	0	1	0	1	0	1
02-Aug	0	195	0	1	0	1	0	1	0	1
03-Aug	2	197	2	3	0	1	0	1	0	1
04-Aug	3	200	0	3	2	3	0	1	0	1
05-Aug	0	200	0	3	0	3	0	1	0	1
06-Aug	0	200	0	3	0	3	0	1	0	1
07-Aug	3	203	0	3	7	10	0	1	0	1

Appendix A.23. Crescent River north bank sonar counts by sector, 1 July through 7 August, 1987.

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
01-Jul	483	175	265	68	31	1	4	1	0	0	0	56	1084
02-Jul	291	14	11	12	31	1	4	17	0	2	3	6	392
03-Jul	226	51	71	14	9	10	0	0	0	1	0	0	382
04-Jul	58	12	36	3	2	23	6	12	2	32	22	6	214
05-Jul	198	42	7	8	6	0	0	0	0	0	0	0	261
Total	1256	294	390	105	79	35	14	30	2	35	25	68	2333
Percent	53.8	12.6	16.7	4.5	3.4	1.5	0.6	1.3	0.1	1.5	1.1	2.9	100.0
06-Jul	1116	1006	370	88	50	44	43	40	39	42	38	38	2914
07-Jul	348	1065	439	89	30	20	26	25	23	24	23	184	2296
08-Jul	715	1264	362	99	38	26	10	4	2	1	0	1	2522
09-Jul	1551	2031	504	98	22	20	6	6	2	2	4	1	4247
10-Jul	214	808	498	231	154	104	36	25	10	3	5	34	2122
Total	3944	6174	2173	605	294	214	121	100	76	72	70	258	14101
Percent	28.0	43.8	15.4	4.3	2.1	1.5	0.9	0.7	0.5	0.5	0.5	1.8	100.0
11-Jul	487	1576	996	236	90	62	36	24	4	4	4	7	3526
12-Jul	379	672	360	105	60	55	19	16	1	3	1	3	1674
13-Jul	798	1075	650	200	97	68	46	29	10	9	0	6	2988
14-Jul	608	588	465	154	96	66	42	16	4	5	6	3	2053
15-Jul	982	992	419	260	201	198	40	23	25	21	21	18	3200
Total	3254	4903	2890	955	544	449	183	108	44	42	32	37	13441
Percent	24.2	36.5	21.5	7.1	4.0	3.3	1.4	0.8	0.3	0.3	0.2	0.3	100.0
16-Jul	803	447	129	18	5	6	3	1	1	1	2	7	1423
17-Jul	661	320	124	54	20	28	80	77	95	115	95	95	1764
18-Jul	1183	753	515	185	97	61	43	24	15	5	2	4	2887
19-Jul	796	646	768	371	176	103	35	23	7	4	1	1	2931
20-Jul	1382	1073	327	141	158	152	3	1	0	1	0	0	3238
Total	4825	3239	1863	769	456	350	164	126	118	126	100	107	12243
Percent	39.4	26.5	15.2	6.3	3.7	2.9	1.3	1.0	1.0	1.0	0.8	0.9	100.0

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Appendix A.23. (p 2 of 2)

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
21-Jul	2677	875	154	41	2	0	0	0	0	0	0	0	3749
22-Jul	2803	2020	526	111	21	9	7	4	0	0	0	0	5501
23-Jul	4420	3233	1024	277	156	146	5	2	1	1	0	0	9265
24-Jul	2972	1464	456	81	42	1	2	1	0	0	0	0	5019
25-Jul	1603	1230	896	296	26	4	26	4	0	0	0	0	4085
Total	14475	8822	3056	806	247	160	40	11	1	1	0	0	27619
Percent	52.4	31.9	11.1	2.9	0.9	0.6	0.1	0.0	0.0	0.0	0.0	0.0	100.0
26-Jul	813	741	402	92	35	22	3	0	0	0	0	0	2108
27-Jul	706	484	275	69	12	4	2	0	0	0	0	0	1552
28-Jul	429	353	182	35	9	4	0	0	0	0	0	0	1012
29-Jul	451	290	68	13	1	0	0	0	0	0	0	0	823
30-Jul	343	137	38	12	8	8	0	1	0	0	0	0	547
Total	2742	2005	965	221	65	38	5	1	0	0	0	0	6042
Percent	45.4	33.2	16.0	3.7	1.1	0.6	0.1	0.0	0.0	0.0	0.0	0.0	100.0
31-Jul	1276	367	112	58	39	40	0	0	1	0	0	0	1893
01-Aug	1273	393	129	50	31	26	0	0	0	0	0	0	1902
02-Aug	929	353	145	18	0	2	0	0	0	0	0	0	1447
03-Aug	396	241	228	93	32	11	2	0	0	0	0	0	1003
04-Aug	425	165	135	60	24	12	1	1	0	0	0	0	823
Total	4299	1519	749	279	126	91	3	1	1	0	0	0	7068
Percent	60.8	21.5	10.6	3.9	1.8	1.3	0.0	0.0	0.0	0.0	0.0	0.0	100.0
05-Aug	158	62	34	3	1	0	3	1	0	0	0	0	262
06-Aug	243	115	39	13	9	9	4	0	0	0	0	0	432
07-Aug	784	409	43	75	33	28	3	0	0	0	0	0	1375
Total	1185	586	116	91	43	37	10	1	0	0	0	0	2069
Percent	57.3	28.3	5.6	4.4	2.1	1.8	0.5	0.0	0.0	0.0	0.0	0.0	100.0

Appendix A.24. Crescent River south bank sonar counts by sector, 1 July through 7 August, 1987.

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
01-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0
02-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0
03-Jul	89	8	4	2	0	0	0	0	0	0	0	0	103
04-Jul	187	1	5	3	0	0	0	0	0	0	0	0	196
05-Jul	102	3	3	1	0	0	0	0	0	0	0	0	109
Total	378	12	12	6	0	0	0	0	0	0	0	0	408
Percent	92.6	2.9	2.9	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
06-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0
07-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0
08-Jul	322	340	165	26	10	14	13	9	0	4	1	3	907
09-Jul	660	628	176	58	31	31	13	15	5	0	0	0	1617
10-Jul	266	790	451	146	55	45	29	41	17	2	3	0	1845
Total	1248	1758	792	230	96	90	55	65	22	6	4	3	4369
Percent	28.6	40.2	18.1	5.3	2.2	2.1	1.3	1.5	0.5	0.1	0.1	0.1	100.0
11-Jul	489	648	247	73	21	12	10	7	2	0	0	1	1510
12-Jul	575	1279	493	131	41	15	20	17	10	3	0	0	2584
13-Jul	629	474	150	62	39	14	22	14	5	2	0	6	1417
14-Jul	742	366	139	49	21	22	15	10	7	3	1	3	1378
15-Jul	774	525	84	12	9	2	2	3	2	2	1	0	1416
Total	3209	3292	1113	327	131	65	69	51	26	10	2	10	8305
Percent	38.6	39.6	13.4	3.9	1.6	0.8	0.8	0.6	0.3	0.1	0.0	0.1	100.0
16-Jul	279	180	42	7	7	1	0	2	0	0	0	0	518
17-Jul	711	280	97	32	18	5	8	3	0	1	1	0	1156
18-Jul	1294	843	118	29	8	6	4	3	4	0	0	0	2309
19-Jul	2376	2147	281	58	18	12	4	2	3	1	0	1	4903
20-Jul	652	288	74	12	4	0	0	0	0	0	0	1	1031
Total	5312	3738	612	138	55	24	16	10	7	2	1	2	9917
Percent	53.6	37.7	6.2	1.4	0.6	0.2	0.2	0.1	0.1	0.0	0.0	0.0	100.0

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Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
21-Jul	1268	323	50	6	3	1	0	0	0	0	0	0	1651
22-Jul	2784	1048	125	23	3	2	1	0	2	0	0	0	3988
23-Jul	1882	1095	150	26	13	3	0	2	1	2	0	0	3336
24-Jul	1365	655	68	15	5	4	3	3	0	0	0	2	2120
25-Jul	886	520	72	9	4	5	2	0	1	0	1	1	1501
Total	8185	3641	465	79	28	15	6	5	4	2	1	3	12596
Percent	65.0	28.9	3.7	0.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
26-Jul	691	361	63	7	4	8	8	1	1	0	0	0	1144
27-Jul	515	349	51	4	5	1	1	2	0	1	0	0	929
28-Jul	405	266	60	4	2	0	1	0	0	0	0	0	738
29-Jul	435	262	54	7	3	0	0	0	0	0	0	0	761
30-Jul	164	35	5	0	0	0	0	0	0	0	0	0	204
Total	2210	1273	233	22	14	9	10	3	1	1	0	0	3776
Percent	58.5	33.7	6.2	0.6	0.4	0.2	0.3	0.1	0.0	0.0	0.0	0.0	100.0
31-Jul	760	118	10	1	0	0	0	0	0	0	0	0	889
01-Aug	965	404	85	9	0	1	1	0	0	0	0	0	1465
02-Aug	585	180	35	3	0	0	0	0	0	0	0	0	803
03-Aug	441	166	12	6	3	0	0	0	0	0	0	0	628
04-Aug	269	146	26	3	0	0	0	0	0	0	0	0	444
Total	3020	1014	168	22	3	1	1	0	0	0	0	0	4229
Percent	71.4	24.0	4.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
05-Aug	111	23	7	0	0	0	0	0	0	0	1	0	142
06-Aug	159	29	7	0	0	0	0	0	0	0	0	0	195
07-Aug	167	53	43	2	1	0	0	0	0	0	0	0	266
Total	437	105	57	2	1	0	0	0	0	0	1	0	603
Percent	72.5	17.4	9.5	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	100.0

Appendix A.25. Crescent River north bank sonar counts by hour, 1 July through 7 August, 1987.

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
01-Jul	10	12	11	10	22	23	29	41	44	26	38	31	37	73	121	58	122	117	43	76	37	21	36	46
02-Jul	18	20	15	20	9	14	12	7	12	15	6	31	16	21	25	18	31	18	27	16	12	8	9	12
03-Jul	8	20	7	6	11	12	8	7	11	18	18	18	3	30	27	15	34	14	21	24	16	17	19	18
04-Jul	12	9	28	17	8	2	7	5	12	12	11	1	3	6	4	9	4	4	5	9	8	11	15	12
05-Jul	2	2	1	3	0	0	1	2	10	10	10	7	3	2	35	31	32	25	19	15	5	5	22	20
06-Jul	16	13	15	57	38	14	5	26	228	1	228	137	125	94	276	352	617	268	163	104	91	45	1	0
07-Jul	0	20	1	0	4	30	42	19	33	96	64	273	222	289	230	222	142	293	162	40	59	23	32	0
08-Jul	0	2	1	0	2	8	0	1	8	5	40	138	107	248	208	207	61	275	564	330	179	73	54	11
09-Jul	0	6	1	4	15	2	5	19	20	24	35	68	146	231	258	215	104	677	1154	798	283	121	57	4
10-Jul	5	3	0	2	4	14	0	2	84	84	84	64	59	61	129	102	188	91	354	465	172	101	53	1
11-Jul	0	4	1	2	0	5	2	0	8	45	70	126	155	156	286	153	247	127	930	737	294	139	34	5
12-Jul	2	3	1	1	9	3	19	7	3	15	35	38	204	113	99	134	40	51	97	71	346	265	95	23
13-Jul	17	22	7	12	8	24	36	17	48	72	41	18	431	189	178	94	187	98	40	17	720	576	120	16
14-Jul	12	4	5	10	8	12	9	27	32	76	214	19	207	151	60	113	102	83	40	43	415	204	162	45
15-Jul	138	138	138	138	138	138	138	138	138	23	119	238	125	211	146	92	162	132	95	42	44	45	422	149
16-Jul	37	37	34	66	54	77	52	46	41	42	96	76	64	92	100	124	81	122	56	45	42	18	9	12
17-Jul	7	9	8	5	2	19	9	34	11	65	77	120	134	156	69	324	166	155	155	162	36	28	8	5
18-Jul	1	3	4	5	27	117	95	137	89	205	369	256	214	218	186	174	235	202	151	70	33	15	46	35
19-Jul	76	27	32	15	8	31	26	48	43	102	156	181	183	334	235	493	250	249	153	162	74	39	9	5
20-Jul	8	16	22	13	13	10	18	9	138	138	138	138	138	348	367	534	298	169	262	216	107	39	52	47
21-Jul	58	60	62	70	61	55	40	52	120	104	88	254	364	255	104	291	477	378	294	202	192	77	70	21
22-Jul	19	4	4	3	5	3	17	33	137	166	263	376	193	402	395	491	488	470	646	565	450	251	92	28

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		Counts by Hour																							
Date		0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
23-Jul	21	14	12	9	9	64	81	116	384	384	388	758	892	592	541	896	520	725	1054	618	828	239	66	54	
24-Jul	25	19	31	14	15	27	45	59	70	101	97	375	698	492	421	247	207	244	400	646	464	173	117	32	
25-Jul	14	9	8	15	13	20	11	45	118	197	197	202	256	176	350	316	229	188	272	741	432	166	76	34	
26-Jul	7	4	10	7	3	9	17	23	22	36	81	111	149	160	111	132	126	96	33	134	389	324	95	29	
27-Jul	20	22	16	5	6	13	6	35	35	22	49	53	113	126	231	117	61	48	48	104	233	140	35	14	
28-Jul	11	15	14	7	11	11	8	18	43	61	46	71	61	43	99	77	78	58	48	48	98	51	25	10	
29-Jul	10	9	11	6	2	6	7	8	20	19	24	26	52	15	69	68	69	89	72	46	74	58	40	23	
30-Jul	12	10	8	10	18	19	22	9	0	1	24	24	34	80	116	64	26	17	14	14	13	7	2	3	
31-Jul	6	19	8	4	8	3	4	3	78	15	78	78	137	150	209	289	241	136	135	77	60	54	67	34	
01-Aug	18	0	8	0	0	1	3	16	7	78	78	5	193	342	354	215	150	172	114	51	55	15	15	12	
02-Aug	4	5	6	1	1	8	16	34	19	11	14	59	86	110	140	168	182	131	114	244	57	29	6	2	
03-Aug	2	4	3	6	7	15	10	15	29	18	18	23	35	45	36	76	82	309	84	88	43	28	13	14	
04-Aug	9	15	20	19	9	4	4	19	6	10	10	8	7	19	30	49	56	55	99	122	224	8	15	6	
05-Aug	7	18	19	4	5	11	6	7	9	10	12	4	15	15	15	20	15	9	7	13	2	10	13	16	
06-Aug	9	6	9	8	7	25	32	32	24	18	14	18	24	20	27	26	18	18	11	18	25	14	11	18	
07-Aug	11	15	11	5	5	6	12	17	17	24	37	72	72	107	73	84	67	136	97	190	144	103	49	21	
Percent		0.7	0.7	0.7	0.7	0.7	1.0	1.0	1.3	2.4	2.9	4.1	5.2	7.1	7.2	7.4	8.4	7.3	7.6	9.4	8.7	8.0	4.6	2.1	0.9

Appendix A.26. Crescent River south bank sonar counts by hour, 1 July through 7 August, 1987.

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
01-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03-Jul	7	12	7	13	2	4	4	7	11	4	3	2	2	1	1	1	2	1	2	1	0	2	13	1
04-Jul	8	11	12	10	11	16	18	13	25	12	2	7	4	4	4	6	3	3	1	2	1	1	10	9
05-Jul	4	5	6	9	10	9	10	5	5	6	8	3	7	6	2	1	2	0	1	0	2	1	6	1
06-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07-Jul	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08-Jul	1	5	3	2	1	1	6	9	3	7	34	70	119	105	36	29	132	166	83	50	12	26	7	
09-Jul	5	6	6	7	11	2	5	1	3	1	5	25	43	136	54	13	34	297	583	214	107	31	25	3
10-Jul	2	9	4	14	0	4	0	0	0	2	10	61	125	12	92	50	40	34	533	472	276	91	14	0
11-Jul	4	8	25	2	2	0	4	3	7	4	3	40	70	146	103	49	36	61	68	177	429	154	109	6
12-Jul	0	29	13	8	1	0	0	7	0	15	28	162	104	167	60	105	78	127	443	798	284	126	24	5
13-Jul	1	24	14	12	8	18	2	2	17	37	61	81	121	130	103	98	75	45	34	33	238	147	96	20
14-Jul	21	8	11	8	9	9	22	5	16	42	61	91	167	85	42	26	27	50	22	27	193	294	84	58
15-Jul	9	26	20	9	2	17	32	9	18	28	214	220	137	84	54	57	45	43	16	23	42	175	104	32
16-Jul	24	17	1	5	13	8	3	12	1	5	16	18	37	39	51	98	69	37	18	18	10	8	2	8
17-Jul	10	21	8	3	5	12	10	6	31	21	37	74	66	107	101	158	115	57	77	102	83	31	15	6
18-Jul	49	23	5	13	53	35	98	131	100	147	88	84	87	80	69	63	77	117	98	90	54	52	253	443
19-Jul	297	87	32	17	26	62	50	71	149	150	290	298	317	269	251	471	654	640	354	283	78	41	13	3
20-Jul	3	11	2	2	9	7	12	7	17	18	27	137	131	158	107	103	70	67	66	46	14	8	3	6
21-Jul	6	22	10	6	1	24	29	36	17	24	83	42	71	110	146	176	157	180	164	186	83	53	21	4
22-Jul	7	0	0	1	2	4	13	25	77	121	208	326	275	271	252	258	371	438	421	391	307	108	83	29

- Continued -

Appendix A.26. (p 2 of 2)

		Counts by Hour																							
Date		0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
23-Jul	10	2	3	31	34	45	83	83	133	83	107	198	221	199	144	144	81	132	384	540	463	167	27	22	
24-Jul	10	7	7	8	6	18	29	18	59	70	49	146	177	150	90	93	65	73	133	387	248	189	67	21	
25-Jul	11	2	0	5	7	29	26	61	58	47	102	109	88	73	58	59	77	31	53	218	174	111	39	63	
26-Jul	14	10	1	2	5	4	22	23	20	55	51	76	101	73	77	55	42	37	36	75	136	168	46	15	
27-Jul	3	11	3	5	9	29	27	27	39	32	21	58	50	88	84	38	37	28	17	36	124	111	40	12	
28-Jul	10	0	5	1	10	8	13	16	24	25	29	32	51	43	51	64	46	37	39	31	73	102	24	4	
29-Jul	0	2	2	18	1	5	10	5	18	15	30	28	42	57	75	37	45	53	32	35	87	110	54	0	
30-Jul	0	0	3	4	6	2	6	1	19	1	0	4	2	0	10	20	19	15	27	36	13	4	4	8	
31-Jul	8	3	3	20	14	2	3	11	8	6	10	71	8	45	71	72	158	89	84	55	56	31	42	19	
01-Aug	1	3	0	2	3	9	26	30	33	49	67	90	142	170	184	191	130	88	61	59	45	39	21	22	
02-Aug	8	12	3	8	7	13	20	14	19	12	13	29	45	76	67	81	109	64	54	94	25	15	12	3	
03-Aug	2	6	2	4	8	10	4	18	20	27	20	10	19	27	25	44	47	62	79	79	37	44	23	11	
04-Aug	1	19	13	13	14	9	35	20	15	5	13	4	16	44	21	19	11	29	62	32	22	19	2	6	
05-Aug	4	1	0	0	1	5	3	0	5	2	9	4	15	5	6	12	19	7	8	14	7	8	3	4	
06-Aug	6	11	5	7	3	6	3	3	1	6	6	3	0	11	12	11	6	13	20	16	13	14	12	7	
07-Aug	1	2	0	5	10	18	43	40	62	85															
Percent		1.2	0.9	0.5	0.6	0.7	1.0	1.5	1.6	2.3	2.6	3.8	5.8	6.4	6.8	5.8	6.1	6.3	7.0	9.4	10.5	8.5	5.6	3.0	1.9

Appendix A.27. Estimated salmon escapement on the north bank of the Crescent River, 1 July through 7 August, 1987. Daily fish targets apportioned to species by gill net catch.

	Sockeye		Pink		Chum		Coho		Chinook	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
01-Jul	1,010	1,010	6	6	6	6	6	6	6	6
02-Jul	375	1,385	2	8	2	8	2	8	2	8
03-Jul	362	1,747	2	10	2	10	2	10	2	10
04-Jul	197	1,944	1	12	1	12	1	12	1	12
05-Jul	277	2,221	2	13	2	13	2	13	2	13
06-Jul	2,729	4,951	16	30	16	30	16	30	16	30
07-Jul	1,949	6,900	12	41	12	41	12	41	12	41
08-Jul	2,463	9,362	15	56	15	56	15	56	15	56
09-Jul	4,147	13,509	25	81	25	81	25	81	25	81
10-Jul	2,087	15,596	13	94	13	94	13	94	13	94
11-Jul	3,444	19,040	21	115	21	115	21	115	21	115
12-Jul	1,637	20,677	10	124	10	124	10	124	10	124
13-Jul	2,918	23,594	18	142	18	142	18	142	18	142
14-Jul	1,979	25,574	12	154	12	154	12	154	12	154
15-Jul	2,455	28,029	15	169	15	169	15	169	15	169
16-Jul	1,420	29,448	9	177	9	177	9	177	9	177
17-Jul	1,186	30,635	7	184	7	184	7	184	7	184
18-Jul	2,823	33,458	17	201	17	201	17	201	17	201
19-Jul	2,862	36,320	17	219	17	219	17	219	17	219
20-Jul	3,171	39,490	19	238	19	238	19	238	19	238
21-Jul	3,719	43,210	22	260	22	260	22	260	22	260
22-Jul	5,372	48,581	32	293	32	293	32	293	32	293
23-Jul	9,052	57,633	55	347	55	347	55	347	55	347
24-Jul	3,884	61,517	204	552	920	1,267	0	347	0	347
25-Jul	3,168	64,685	167	718	750	2,017	0	347	0	347
26-Jul	1,634	66,319	86	804	387	2,404	0	347	0	347
27-Jul	1,194	67,513	63	867	283	2,687	0	347	0	347
28-Jul	785	68,298	41	908	186	2,873	0	347	0	347
29-Jul	638	68,936	34	942	151	3,024	0	347	0	347
30-Jul	420	69,357	22	964	100	3,124	0	347	0	347
31-Jul	1,470	70,827	77	1,042	348	3,472	0	347	0	347
01-Aug	1,479	72,306	78	1,119	350	3,822	0	347	0	347
02-Aug	1,122	73,428	59	1,178	266	4,088	0	347	0	347
03-Aug	778	74,206	41	1,219	184	4,272	0	347	0	347
04-Aug	638	74,844	34	1,253	151	4,423	0	347	0	347
05-Aug	196	75,040	10	1,263	46	4,470	0	347	0	347
06-Aug	308	75,348	16	1,279	73	4,543	0	347	0	347
07-Aug	1,322	76,670	70	1,349	313	4,856	0	347	0	347

Appendix A.28. Estimated salmon escapement on the south bank of the Crescent River, 1 July through 6 August, 1987. Daily fish targets apportioned to species by gill net catch.

	Sockeye		Pink		Chum		Coho		Chinook	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
01-Jul	392	392	2	2	2	2	2	2	2	2
02-Jul	145	537	1	3	1	3	1	3	1	3
03-Jul	99	636	1	4	1	4	1	4	1	4
04-Jul	188	824	1	5	1	5	1	5	1	5
05-Jul	106	931	1	6	1	6	1	6	1	6
06-Jul	1,058	1,989	6	12	6	12	6	12	6	12
07-Jul	1,076	3,065	6	18	6	18	6	18	6	18
08-Jul	886	3,951	5	24	5	24	5	24	5	24
09-Jul	1,579	5,530	10	33	10	33	10	33	10	33
10-Jul	1,802	7,331	11	44	11	44	11	44	11	44
11-Jul	2,523	9,855	15	59	15	59	15	59	15	59
12-Jul	1,474	11,329	9	68	9	68	9	68	9	68
13-Jul	1,385	12,714	8	77	8	77	8	77	8	77
14-Jul	1,346	14,059	8	85	8	85	8	85	8	85
15-Jul	1,891	15,951	11	96	11	96	11	96	11	96
16-Jul	505	16,455	3	99	3	99	3	99	3	99
17-Jul	1,129	17,584	7	106	7	106	7	106	7	106
18-Jul	2,255	19,839	14	120	14	120	14	120	14	120
19-Jul	4,788	24,627	29	148	29	148	29	148	29	148
20-Jul	1,038	25,665	6	155	6	155	6	155	6	155
21-Jul	1,613	27,278	10	164	10	164	10	164	10	164
22-Jul	3,891	31,169	23	188	23	188	23	188	23	188
23-Jul	3,099	34,268	19	206	19	206	19	206	19	206
24-Jul	1,644	35,912	87	293	389	596	0	206	0	206
25-Jul	1,164	37,076	61	354	276	872	0	206	0	206
26-Jul	887	37,964	47	401	210	1,082	0	206	0	206
27-Jul	720	38,684	38	439	171	1,252	0	206	0	206
28-Jul	572	39,256	30	469	136	1,388	0	206	0	206
29-Jul	590	39,847	31	500	140	1,528	0	206	0	206
30-Jul	159	40,005	8	508	38	1,565	0	206	0	206
31-Jul	690	40,696	36	545	163	1,729	0	206	0	206
01-Aug	1,136	41,832	60	605	269	1,998	0	206	0	206
02-Aug	623	42,455	33	637	147	2,145	0	206	0	206
03-Aug	487	42,942	26	663	115	2,261	0	206	0	206
04-Aug	344	43,286	18	681	82	2,342	0	206	0	206
05-Aug	110	43,396	6	687	26	2,368	0	206	0	206
06-Aug	152	43,548	8	695	36	2,404	0	206	0	206

Appendix A.29. Length composition of the major age classes of sockeye salmon in the Crescent River, 1980-87. Length measured from mid-eye to fork of tail.

Year	Age Class	Male				Female				Total		
		Ave Length (mm)	Stndrd Error	Sample Size	Ave Length (mm)	Stndrd Error	Sample Size	Ave Length (mm)	Stndrd Error	Sample Size	Male/Female	
1980	1.2	472	6.3	47	471	7.2	31	472		78	1.5:1	
1981		522	8.6	59	491	8.6	33	511	8.6	92	1.8:1	
1982		467	6.1	47	487	6.5	25	474	4.6	72	1.9:1	
<hr/>												
1980	1.3	568	2.1	167	549	1.5	223	557		390	0.7:1	
1981		576	2.5	121	555	2.6	172	564		293	0.7:1	
1982		586	1.4	303	556	1.4	259	572	1.4	562	1.2:1	
1983		570	2.1	111	542	1.8	169	553	1.3	280	0.7:1	
1984		574	4.7	60	552	2.4	72	562	2.5	132	0.8:1	
1985		565	3.7	75	551	1.7	111	557	1.8	186	0.7:1	
1987		601	2.7	54	573	3.2	37	590	2.1	91	1.5:1	
<hr/>												
1981	2.2	487	5.5	40	519	4.5	57	506		97	0.7:1	
1983		494	3.9	93	488	3.0	89	491	2.5	182	1.0:1	
1984		499	4.2	81	507	3.7	75	503	2.8	156	1.1:1	
1985		496	5.4	75	490	3.5	47	494	3.6	122	1.6:1	
<hr/>												
1980	2.3	584	2.0	158	554	1.6	237	566		395	0.7:1	
1983		569	3.5	43	550	2.1	80	556	1.8	123	0.5:1	
1984		581	1.5	261	553	1.6	202	569	1.1	463	1.3:1	
1985		568	3.6	94	551	1.6	161	557	1.7	255	0.6:1	
1986		573	4.8	44	556	2.7	45	564	2.7	89	1.0:1	
1987		595	3.7	49	573	3.3	37	586	2.6	86	1.3:1	

Appendix A.30. Weight composition of the major age classes of sockeye salmon in the Crescent River, 1980-87.

Year	Age Class	Male			Female			Total		
		Ave Weight (Kg)	Stndrd Error	Sample Size	Ave Weight (Kg)	Stndrd Error	Sample Size	Ave Weight (Kg)	Stndrd Error	Sample Size
1981	1.2	2.0	0.10	47	1.8	0.09	31	2.0		78
		2.7	0.15	59	2.0	0.11	33	2.5	0.13	92
		1.8	0.08	47	2.0	0.09	25	1.9	0.06	72
1980	1.3	3.1	0.07	59	2.7	0.04	91	2.9		150
		3.5	0.05	121	2.9	0.04	172	3.2		293
		3.7	0.03	303	2.9	0.02	258	3.3	0.03	561
		3.3	0.04	111	2.7	0.03	169	2.9	0.02	280
		3.5	0.09	60	2.8	0.04	72	3.1	0.04	132
		2.97	0.06	75	2.50	0.03	111	2.69	0.03	186
		3.18	0.14	12	2.57	0.08	10	2.90	0.09	22
		3.60	0.11	12	2.86	0.10	9	3.30	0.07	21
1981	2.2	2.4	0.13	40	2.5	0.07	57	2.4		97
		2.3	0.06	93	2	0.03	89	2.1	0.04	182
		2.3	0.07	81	2.2	0.06	75	2.2	0.05	156
		1.98	0.07	75	1.81	0.04	47	1.91	0.05	122
		2.05	0.16	9	2.22	0.23	9	2.14	0.14	18
1981	2.3	3.7	0.04	158	2.9	0.03	237	3.2		395
		3.2	0.06	43	2.8	0.03	80	2.9	0.03	123
		3.7	0.03	261	2.8	0.03	202	3.3	0.02	463
		2.98	0.06	94	2.56	0.03	161	2.72	0.03	255
		3.20	0.09	44	2.71	0.04	45	2.95	0.05	89
		3.51	0.21	6	3.09	0.09	13	3.33	0.09	19

Appendix A.31. Estimated salmon escapement into the Yentna River, north and south banks combined, 1 July through 14 August, 1987. Daily fish targets apportioned to species by fish wheel catch.

Date	Sockeye		Pink		Chum		Coho		Chinook	
	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
01-Jul	20	20	157	157	2	2	3	3	14	14
02-Jul	25	45	206	362	2	4	4	6	17	32
03-Jul	33	78	281	643	3	7	5	11	22	53
04-Jul	34	112	310	953	3	10	5	16	21	74
05-Jul	34	147	297	1,249	3	13	5	22	22	96
06-Jul	33	180	299	1,548	3	16	5	27	21	117
07-Jul	31	211	273	1,821	3	19	5	31	19	136
08-Jul	35	246	307	2,128	3	23	5	37	22	158
09-Jul	31	277	274	2,402	3	26	5	41	19	177
10-Jul	25	301	208	2,610	2	28	4	45	16	194
11-Jul	40	341	351	2,961	4	31	6	51	25	219
12-Jul	17	358	509	3,470	0	31	8	59	11	230
13-Jul	16	374	462	3,932	0	31	7	67	11	241
14-Jul	81	455	369	4,301	4	35	2	68	3	244
15-Jul	92	546	421	4,722	4	40	2	70	3	247
16-Jul	108	654	742	5,464	0	40	11	82	8	255
17-Jul	268	922	848	6,312	25	65	22	103	13	268
18-Jul	370	1,292	1,064	7,377	40	105	34	137	18	286
19-Jul	500	1,791	947	8,323	33	138	59	196	20	306
20-Jul	459	2,250	899	9,222	26	164	51	247	9	315
21-Jul	819	3,069	2,164	11,387	99	263	40	287	22	337
22-Jul	811	3,880	1,732	13,119	45	308	16	302	2	339
23-Jul	3,165	7,046	1,989	15,108	140	448	41	343	2	341
24-Jul	7,340	14,386	3,599	18,707	452	901	70	413	4	344
25-Jul	7,422	21,808	7,138	25,845	316	1,217	223	636	0	344
26-Jul	7,344	29,152	8,418	34,263	467	1,683	294	929	0	344
27-Jul	5,634	34,786	10,931	45,193	314	1,998	568	1,498	0	344
28-Jul	3,870	38,656	7,303	52,497	1,059	3,056	321	1,818	14	359
29-Jul	2,512	41,168	3,641	56,138	529	3,585	289	2,108	0	359
30-Jul	1,984	43,151	2,777	58,915	412	3,996	461	2,568	0	359
31-Jul	2,032	45,183	2,369	61,284	379	4,376	165	2,733	10	368
01-Aug	1,508	46,691	1,067	62,351	379	4,754	141	2,874	3	371
02-Aug	2,713	49,404	2,127	64,479	125	4,879	320	3,195	0	371
03-Aug	2,598	52,002	2,755	67,234	381	5,260	414	3,609	0	371
04-Aug	2,365	54,367	3,264	70,498	652	5,911	476	4,084	0	371
05-Aug	2,110	56,477	2,680	73,178	813	6,724	281	4,366	0	371
06-Aug	1,144	57,621	1,383	74,560	902	7,626	99	4,465	0	371
07-Aug	936	58,558	691	75,251	553	8,179	86	4,551	7	378
08-Aug	725	59,283	544	75,795	434	8,613	64	4,615	5	383

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Appendix A.31. (p 2 of 2)

	Sockeye		Pink		Chum		Coho		Chinook	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
09-Aug	2,096	61,379	1,619	77,414	1,284	9,897	175	4,790	13	396
10-Aug	1,998	63,377	2,466	79,880	2,122	12,019	422	5,212	11	407
11-Aug	1,570	64,946	2,134	82,015	1,940	13,959	467	5,679	0	407
12-Aug	664	65,611	1,133	83,148	1,784	15,743	281	5,960	0	407
13-Aug	271	65,882	620	83,768	1,264	17,007	160	6,120	0	407
14-Aug	171	66,053	331	84,099	851	17,858	157	6,277	0	407

Appendix A.32. Estimated salmon escapement on the north bank of the Yentna River, 1 July through 14 August, 1987. Daily fish targets apportioned to species by fish wheel catch.

	Sockeye		Pink		Coho		Chum		Chinook	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
01-Jul	12	12	72	72	1	1	1	1	11	11
02-Jul	14	27	84	156	1	1	1	3	13	24
03-Jul	17	44	98	254	1	2	2	4	15	39
04-Jul	15	58	84	338	1	3	1	6	13	53
05-Jul	16	75	95	433	1	4	2	7	15	67
06-Jul	14	89	84	517	1	4	1	8	13	80
07-Jul	13	102	78	594	1	5	1	10	12	93
08-Jul	16	119	95	689	1	6	2	11	15	107
09-Jul	14	132	81	770	1	6	1	13	13	120
10-Jul	13	145	75	845	1	7	1	14	12	132
11-Jul	18	163	102	947	1	8	2	16	16	148
12-Jul	4	167	115	1,062	0	8	2	17	5	152
13-Jul	5	171	136	1,198	0	8	2	19	5	158
14-Jul	33	205	116	1,314	0	8	2	21	1	159
15-Jul	36	241	127	1,441	0	8	2	23	1	159
16-Jul	25	266	160	1,601	0	8	2	25	4	163
17-Jul	20	286	124	1,725	0	8	2	27	3	167
18-Jul	46	332	121	1,846	8	16	8	35	5	171
19-Jul	41	374	108	1,954	7	23	7	42	4	175
20-Jul	28	402	110	2,064	2	25	2	44	3	179
21-Jul	22	424	85	2,150	2	27	2	46	3	181
22-Jul	63	487	95	2,244	3	29	1	47	2	183
23-Jul	74	561	110	2,355	3	33	2	49	2	185
24-Jul	119	680	179	2,534	5	38	3	51	4	189
25-Jul	311	992	363	2,897	17	55	17	68	0	189
26-Jul	637	1,629	787	3,684	80	134	57	126	0	189
27-Jul	414	2,043	777	4,461	28	163	54	179	0	189
28-Jul	373	2,416	732	5,193	53	216	0	179	14	203
29-Jul	312	2,728	493	5,686	49	265	18	198	0	203
30-Jul	434	3,163	809	6,496	118	383	0	198	0	203
31-Jul	216	3,378	288	6,783	55	439	8	206	0	203
01-Aug	219	3,597	234	7,017	56	495	30	236	3	206
02-Aug	160	3,757	208	7,225	39	534	12	248	0	206
03-Aug	357	4,114	403	7,629	76	611	13	260	0	206
04-Aug	304	4,418	604	8,233	146	757	50	311	0	206
05-Aug	241	4,659	534	8,767	120	877	39	350	0	206
06-Aug	149	4,808	294	9,061	146	1,023	33	383	0	206
07-Aug	153	4,961	151	9,212	114	1,137	5	388	0	206
08-Aug	149	5,110	147	9,359	111	1,249	5	392	0	206

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Appendix A.32. (p 2 of 2)

	Sockeye		Pink		Coho		Chum		Chinook	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
09-Aug	588	5,698	579	9,937	439	1,687	19	411	0	206
10-Aug	302	6,000	1,025	10,962	818	2,506	125	536	0	206
11-Aug	216	6,216	772	11,734	578	3,084	104	640	0	206
12-Aug	107	6,323	337	12,072	526	3,609	64	703	0	206
13-Aug	72	6,395	328	12,400	532	4,141	40	743	0	206
14-Aug	49	6,444	150	12,550	281	4,422	35	778	0	206

Appendix A.33. Estimated salmon escapement on the south bank of the Yentna River, 1 July through 14 August, 1987. Daily fish targets apportioned to species by fish wheel catch.

	Sockeye		Pink		Coho		Chum		Chinook	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
01-Jul	7	7	84	84	1	1	1	1	3	3
02-Jul	11	18	122	206	1	2	2	4	4	7
03-Jul	16	34	183	389	2	5	3	7	6	14
04-Jul	20	54	226	615	3	7	4	11	8	22
05-Jul	18	72	201	816	2	10	4	14	7	29
06-Jul	19	91	215	1,031	3	12	4	18	8	36
07-Jul	17	108	195	1,226	2	14	3	22	7	43
08-Jul	19	127	213	1,439	3	17	4	25	8	51
09-Jul	17	144	193	1,632	2	19	3	29	7	58
10-Jul	12	156	133	1,765	2	21	2	31	5	62
11-Jul	22	178	249	2,014	3	24	4	36	9	71
12-Jul	13	191	394	2,408	0	24	7	42	7	78
13-Jul	11	202	326	2,734	0	24	6	48	6	83
14-Jul	48	250	252	2,986	4	28	0	48	2	85
15-Jul	56	306	294	3,280	4	32	0	48	2	87
16-Jul	83	388	582	3,862	0	32	9	56	4	92
17-Jul	248	636	724	4,587	25	57	20	76	10	102
18-Jul	323	959	944	5,531	32	89	26	102	13	115
19-Jul	458	1,418	839	6,369	26	115	52	154	16	130
20-Jul	431	1,848	789	7,158	24	139	49	202	6	136
21-Jul	797	2,645	2,079	9,237	97	236	39	241	19	156
22-Jul	748	3,393	1,637	10,874	42	279	14	255	0	156
23-Jul	3,092	6,485	1,878	12,753	137	416	39	294	0	156
24-Jul	7,221	13,705	3,420	16,173	447	863	67	362	0	156
25-Jul	7,111	20,816	6,774	22,947	299	1,162	206	567	0	156
26-Jul	6,707	27,523	7,631	30,578	387	1,549	236	804	0	156
27-Jul	5,220	32,743	10,154	40,732	286	1,835	514	1,318	0	156
28-Jul	3,497	36,240	6,571	47,304	1,005	2,840	321	1,639	0	156
29-Jul	2,199	38,439	3,148	50,452	480	3,320	271	1,910	0	156
30-Jul	1,549	39,989	1,968	52,420	293	3,613	461	2,370	0	156
31-Jul	1,816	41,805	2,081	54,501	324	3,937	157	2,527	10	165
01-Aug	1,290	43,094	834	55,335	322	4,259	111	2,639	0	165
02-Aug	2,552	45,647	1,919	57,253	86	4,345	308	2,947	0	165
03-Aug	2,241	47,888	2,352	59,605	304	4,649	401	3,348	0	165
04-Aug	2,061	49,949	2,659	62,265	505	5,154	425	3,774	0	165
05-Aug	1,870	51,819	2,147	64,411	692	5,847	242	4,016	0	165
06-Aug	995	52,814	1,088	65,499	756	6,603	66	4,082	0	165
07-Aug	783	53,597	540	66,039	439	7,042	81	4,163	7	172
08-Aug	576	54,173	397	66,437	323	7,365	60	4,223	5	177

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Appendix A.33. (p 2 of 2)

	Sockeye		Pink		Coho		Chum		Chinook	
Date	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
09-Aug	1,508	55,681	1,040	67,477	845	8,210	156	4,379	13	190
10-Aug	1,695	57,377	1,441	68,918	1,303	9,513	297	4,676	11	201
11-Aug	1,354	58,731	1,363	70,280	1,363	10,876	364	5,040	0	201
12-Aug	557	59,287	796	71,076	1,258	12,134	217	5,257	0	201
13-Aug	199	59,486	292	71,368	732	12,866	120	5,377	0	201
14-Aug	122	59,608	180	71,549	571	13,436	122	5,499	0	201

Appendix A.34. Yentna River south bank sonar counts by sector, 1 July through 14 August, 1987.

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
01-Jul	48	13	17	5	1	0	0	0	0	0	7	1	92
02-Jul	19	21	45	7	3	0	2	5	2	12	33	24	173
03-Jul	107	37	23	7	7	2	2	0	11	0	9	0	205
04-Jul	93	42	50	15	7	12	1	4	2	3	22	10	261
05-Jul	107	38	45	9	5	1	3	1	1	1	0	21	232
Total	374	151	180	43	23	15	8	10	16	16	71	56	963
Percent	38.8	15.7	18.7	4.5	2.4	1.6	0.8	1.0	1.7	1.7	7.4	5.8	100.0
06-Jul	143	28	46	16	4	0	2	6	0	0	1	3	249
07-Jul	64	30	21	42	5	2	4	2	2	1	1	48	222
08-Jul	95	36	46	34	4	1	5	9	2	3	2	0	237
09-Jul	70	28	37	32	10	4	4	4	1	2	4	16	212
10-Jul	120	32	34	19	9	1	4	2	0	2	2	22	247
Total	492	154	184	143	32	8	19	23	5	8	10	89	1167
Percent	42.2	13.2	15.8	12.3	2.7	0.7	1.6	2.0	0.4	0.7	0.9	7.6	100.0
11-Jul	114	53	41	14	9	3	10	4	4	5	4	26	287
12-Jul	116	77	55	26	6	5	17	19	7	5	4	75	412
13-Jul	122	67	62	26	7	1	6	10	2	5	4	34	346
14-Jul	165	62	45	12	1	0	0	1	0	0	0	20	306
15-Jul	122	72	67	22	5	1	7	8	1	0	2	49	356
Total	639	331	270	100	28	10	40	42	14	15	14	204	1707
Percent	37.4	19.4	15.8	5.9	1.6	0.6	2.3	2.5	0.8	0.9	0.8	12.0	100.0
16-Jul	165	181	137	38	19	2	6	13	7	25	18	60	671
17-Jul	353	313	246	70	16	0	6	4	2	1	4	11	1026
18-Jul	409	509	255	101	49	0	1	1	1	4	3	8	1341
19-Jul	394	568	286	89	4	0	0	10	0	15	0	11	1377
20-Jul	289	460	373	127	13	0	9	4	0	1	2	20	1298
Total	1610	2031	1297	425	101	2	22	32	10	46	27	110	5713
Percent	28.2	35.6	22.7	7.4	1.8	0.0	0.4	0.6	0.2	0.8	0.5	1.9	100.0
21-Jul	799	1282	665	130	85	32	2	0	0	24	10	3	3032
22-Jul	490	1213	635	95	7	2	0	0	0	0	0	0	2442
23-Jul	718	2269	1932	386	74	19	4	0	0	12	1	2	5417

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Appendix A.34. (p 2 of 2)

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
24-Jul	1135	4412	4068	1203	220	28	16	8	4	22	9	29	11154
25-Jul	1489	5483	4923	1751	380	154	49	18	6	4	31	114	14402
Total	4631	14659	12223	3565	766	235	71	26	10	62	51	148	36447
Percent	12.7	40.2	33.5	9.8	2.1	0.6	0.2	0.1	0.0	0.2	0.1	0.4	100.0
26-Jul	2106	6417	4396	1382	158	310	30	17	4	22	37	82	14961
27-Jul	3208	7144	4397	1419	200	12	61	43	17	17	38	158	16714
28-Jul	2025	4792	2999	1018	174	10	56	38	13	21	42	207	11395
29-Jul	1406	2680	1453	415	63	6	25	11	2	8	7	22	6098
30-Jul	1058	1809	1089	257	15	1	3	2	0	5	9	14	4262
Total	9803	22842	14334	4491	610	339	175	111	36	73	133	483	53430
Percent	18.3	42.8	26.8	8.4	1.1	0.6	0.3	0.2	0.1	0.1	0.2	0.9	100.0
31-Jul	1195	1637	1235	280	16	2	6	2	0	0	1	14	4388
01-Aug	487	934	795	263	39	3	11	4	0	2	6	13	2557
02-Aug	694	1674	1603	679	116	14	27	10	8	10	15	15	4865
03-Aug	816	1603	1657	815	181	44	98	64	21	35	49	82	5465
04-Aug	658	1163	1407	877	385	83	249	166	98	108	150	307	5651
Total	3850	7011	6697	2914	737	146	391	246	127	155	221	431	22926
Percent	16.8	30.6	29.2	12.7	3.2	0.6	1.7	1.1	0.6	0.7	1.0	1.9	100.0
05-Aug	983	1281	1168	570	249	68	155	99	65	55	64	194	4951
06-Aug	913	1218	562	119	14	2	9	4	1	4	6	55	2907
07-Aug	1053	664	126	7	0	0	0	0	0	0	0	0	1850
08-Aug	696	453	189	17	1	0	0	1	0	0	4	0	1361
09-Aug	958	1052	756	301	70	1	46	55	32	69	100	122	3562
Total	4603	4668	2801	1014	334	71	210	159	98	128	174	371	14631
Percent	31.5	31.9	19.1	6.9	2.3	0.5	1.4	1.1	0.7	0.9	1.2	2.5	100.0
10-Aug	1510	1173	905	323	116	12	131	83	106	129	104	166	4758
11-Aug	970	981	751	373	117	29	189	174	142	179	210	328	4443
12-Aug	818	687	637	234	50	9	47	48	27	68	72	131	2828
13-Aug	366	317	282	115	44	2	25	30	10	31	37	84	1299
14-Aug	368	252	200	61	7	0	5	10	14	24	4	50	995
Total	4032	3410	2775	1106	290	52	397	345	299	431	427	759	14323
Percent	28.2	23.8	19.4	7.7	2.0	0.4	2.8	2.4	2.1	3.0	3.0	5.3	100.0

Appendix A.35. Yentna River north bank sonar counts by sector, 1 July through 14 August, 1987.

Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
01-Jul	47	14	13	1	0	0	2	3	8	8	3	5	104
02-Jul	15	8	9	11	0	0	2	9	7	23	14	10	108
03-Jul	49	29	4	2	1	0	7	3	5	15	4	13	132
04-Jul	41	9	7	2	0	0	3	1	6	2	14	26	111
05-Jul	34	14	7	0	0	0	3	5	7	13	13	35	131
Total	186	74	40	16	1	0	17	21	33	61	48	89	586
Percent	31.7	12.6	6.8	2.7	0.2	0.0	2.9	3.6	5.6	10.4	8.2	15.2	100.0
06-Jul	71	15	4	0	0	0	1	0	1	1	13	7	113
07-Jul	59	14	4	1	0	0	0	2	7	4	6	8	105
08-Jul	69	25	4	0	0	0	2	2	4	7	1	14	128
09-Jul	52	20	2	0	0	0	2	1	8	8	3	12	108
10-Jul	48	15	5	0	0	0	1	1	3	6	2	5	86
Total	299	89	19	1	0	0	6	6	23	26	25	46	540
Percent	55.4	16.5	3.5	0.2	0.0	0.0	1.1	1.1	4.3	4.8	4.6	8.5	100.0
11-Jul	78	23	6	0	0	0	1	0	1	2	3	17	131
12-Jul	74	17	4	0	0	0	0	1	2	4	1	17	120
13-Jul	34	30	13	2	0	0	1	1	2	1	8	50	142
14-Jul	39	47	21	0	0	0	2	8	5	4	3	22	151
15-Jul	48	32	13	3	0	0	1	3	9	3	21	17	150
Total	273	149	57	5	0	0	5	13	19	14	36	123	694
Percent	39.3	21.5	8.2	0.7	0.0	0.0	0.7	1.9	2.7	2.0	5.2	17.7	100.0
16-Jul	78	38	20	3	2	0	1	1	2	6	3	34	188
17-Jul	63	25	12	5	0	0	0	2	0	10	11	14	142
18-Jul	79	59	13	1	1	1	0	2	0	6	2	18	182
19-Jul	53	49	21	2	1	0	1	0	3	3	6	22	161
20-Jul	37	57	16	1	1	1	0	1	1	6	6	19	146
Total	310	228	82	12	5	2	2	6	6	31	28	107	819
Percent	37.9	27.8	10.0	1.5	0.6	0.2	0.2	0.7	0.7	3.8	3.4	13.1	100.0
21-Jul	48	33	6	0	0	0	0	0	0	4	0	13	104
22-Jul	90	61	11	1	0	0	0	0	0	1	0	0	164
23-Jul	111	41	15	5	0	0	0	3	3	3	3	8	192

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Date	Count by Sector												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
24-Jul	175	51	35	4	1	0	2	4	4	10	9	14	309
25-Jul	226	108	74	27	7	4	31	41	39	41	47	65	710
Total	650	294	141	37	8	4	33	48	46	59	59	100	1479
Percent	43.9	19.9	9.5	2.5	0.5	0.3	2.2	3.2	3.1	4.0	4.0	6.8	100.0
26-Jul	267	283	215	72	12	3	67	76	107	132	158	169	1561
27-Jul	172	364	302	91	8	1	50	47	35	56	61	85	1272
28-Jul	198	402	251	77	9	1	29	25	21	43	61	57	1174
29-Jul	257	336	137	30	5	2	18	6	13	12	28	29	873
30-Jul	336	285	123	10	2	0	5	7	2	4	5	22	801
Total	1230	1670	1028	280	36	7	169	161	178	247	313	362	5681
Percent	21.7	29.4	18.1	4.9	0.6	0.1	3.0	2.8	3.1	4.3	5.5	6.4	100.0
31-Jul	300	160	69	15	1	0	3	2	4	7	2	2	565
01-Aug	212	124	86	24	12	9	10	9	6	13	8	14	527
02-Aug	180	77	62	12	3	0	6	4	9	7	20	38	418
03-Aug	256	171	166	86	20	3	7	14	30	35	37	24	849
04-Aug	331	230	204	61	26	3	33	32	41	24	44	77	1106
Total	1279	762	587	198	62	15	59	61	90	86	111	155	3465
Percent	36.9	22.0	16.9	5.7	1.8	0.4	1.7	1.8	2.6	2.5	3.2	4.5	100.0
05-Aug	283	293	166	49	12	4	16	12	8	20	20	36	919
06-Aug	234	233	84	9	2	0	0	2	1	8	3	44	620
07-Aug	253	159	11	0	0	0	0	0	0	0	0	0	423
08-Aug	241	131	30	5	0	0	2	0	1	2	0	0	412
09-Aug	492	459	305	130	65	60	35	40	41	44	46	43	1760
Total	1503	1275	596	193	79	64	53	54	51	74	69	123	4134
Percent	36.4	30.8	14.4	4.7	1.9	1.5	1.3	1.3	1.2	1.8	1.7	3.0	100.0
10-Aug	753	733	426	97	18	4	17	19	12	59	55	87	2280
11-Aug	566	581	220	52	7	0	27	16	12	49	83	58	1671
12-Aug	396	337	146	41	5	0	7	6	6	15	36	40	1035
13-Aug	401	302	136	44	8	0	6	3	4	15	19	51	989
14-Aug	194	161	57	22	3	1	2	1	0	3	31	52	527
Total	2310	2114	985	256	41	5	59	45	34	141	224	288	6502
Percent	35.5	32.5	15.1	3.9	0.6	0.1	0.9	0.7	0.5	2.2	3.4	4.4	100.0

Appendix A.36. Yentna River north bank sonar counts by hour, 1 July through 14 August, 1987.

Date	Counts by Hour																									
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400		
01-Jul	1	4	5	5	2	7	5	5	3	5	4	13	7	6	2	3	5	4	2	2	1	2	1	2	4	
02-Jul	3	6	3	11	1	8	9	3	3	5	9	7	3	5	2	1	2	5	1	2	2	9	5	2	0	
03-Jul	3	12	1	4	8	4	4	6	2	5	3	14	1	2	19	9	2	3	11	2	2	2	9	5	2	1
04-Jul	2	4	5	2	0	6	2	8	6	6	7	1	6	7	6	8	2	2	8	7	2	7	4	7	3	
05-Jul	3	2	10	3	12	1	4	9	4	2	2	5	8	12	4	11	4	6	4	4	6	5	6	4	4	
06-Jul	2	3	2	6	7	7	6	5	3	7	3	7	7	5	5	7	5	1	1	14	3	4	1	2	2	
07-Jul	5	2	2	1	7	7	3	5	6	2	6	5	2	5	8	2	3	4	3	10	2	2	5	8	2	
08-Jul	3	2	1	3	4	5	4	3	8	13	8	3	12	3	8	9	5	8	6	5	2	5	7	1	1	
09-Jul	1	9	3	6	4	3	0	7	8	1	7	11	2	7	8	7	1	0	2	4	3	6	4	4	4	
10-Jul	0	1	5	4	3	3	4	6	3	4	1	7	6	1	2	2	1	3	2	3	3	3	7	7	8	
11-Jul	1	3	5	12	0	5	16	10	4	3	7	4	7	2	6	6	5	9	7	5	3	6	5	0	0	
12-Jul	6	3	7	2	6	2	3	0	4	10	3	3	17	5	8	8	3	4	6	1	7	3	9	0	0	
13-Jul	1	8	8	3	1	4	0	11	5	14	9	3	3	1	8	4	8	2	11	12	4	10	4	8	8	
14-Jul	9	7	4	9	7	6	4	9	4	14	12	8	10	3	1	3	9	6	3	5	2	6	10	0	0	
15-Jul	6	7	7	3	2	2	1	0	11	6	12	8	2	4	2	9	18	12	1	8	17	9	2	1	1	
16-Jul	4	6	8	5	16	9	6	9	13	14	4	9	9	5	12	5	6	7	5	10	1	9	8	8	8	
17-Jul	3	8	5	5	2	5	11	10	5	3	13	3	2	13	7	1	8	3	8	7	2	3	8	7	7	
18-Jul	5	4	5	6	6	3	3	9	13	11	7	2	14	6	14	8	4	6	14	11	4	13	10	4	4	
19-Jul	16	5	4	3	9	5	3	6	8	5	1	4	2	6	14	7	6	16	7	13	8	8	5	0	0	
20-Jul	15	7	17	6	9	7	2	2	1	4	8	3	10	3	5	4	8	6	2	6	7	3	6	5	5	
21-Jul	5	4	4	2	1	10	4	4	4	6	5	2	3	2	2	3	5	9	4	10	7	5	1	2	2	
22-Jul	7	5	4	5	1	8	6	4	7	5	6	9	5	9	7	12	13	8	4	4	5	15	8	7	7	

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Appendix A.36. (p 2 of 3)

Counts by Hour

Date	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
23-Jul	2	3	5	9	11	5	6	4	3	9	9	8	8	6	9	4	1	4	16	16	17	10	21	6
24-Jul	5	3	4	7	9	17	11	3	9	13	10	7	2	5	15	15	8	4	5	14	8	20	56	59
25-Jul	30	33	15	27	21	8	17	20	37	46	28	22	21	38	51	33	35	44	36	26	34	32	26	30
26-Jul	50	54	43	48	69	39	63	41	89	73	72	90	47	76	92	60	64	87	69	47	61	47	74	106
27-Jul	65	84	69	57	61	45	68	25	36	30	39	54	48	54	49	76	45	66	68	35	33	50	46	69
28-Jul	51	52	72	84	57	36	51	26	33	34	30	50	36	54	67	33	71	62	44	32	45	53	47	54
29-Jul	54	56	26	28	28	27	32	26	31	29	49	35	42	37	40	54	54	38	33	18	33	22	27	54
30-Jul	23	34	39	56	51	37	20	22	43	30	21	17	35	44	55	38	30	25	39	27	23	25	32	35
31-Jul	17	12	21	21	13	6	13	20	14	25	21	21	15	36	16	46	21	23	41	34	46	17	37	29
01-Aug	26	42	18	27	10	13	7	16	20	29	10	34	18	18	18	18	27	24	41	18	23	23	25	22
02-Aug	14	14	24	15	16	9	24	12	13	16	21	22	17	23	15	17	18	26	16	14	17	23	14	18
03-Aug	16	27	28	17	18	14	11	15	24	35	27	65	51	49	43	58	51	41	42	52	47	20	52	46
04-Aug	47	27	24	29	24	26	30	29	43	12	36	65	57	78	63	47	40	73	82	71	49	66	41	47
05-Aug	70	29	54	37	19	21	18	38	48	37	44	33	45	41	32	64	33	49	21	36	46	36	32	36
06-Aug	33	23	29	31	20	24	23	17	23	25	14	25	36	24	32	52	28	32	22	26	12	8	32	29
07-Aug	30	18	22	24	25	19	11	10	15	13	17	11	15	12	25	23	28	11	8	25	9	24	4	24
08-Aug	15	16	8	11	8	2	8	15	14	5	6	30	28	24	25	34	15	31	13	31	24	18	14	17
09-Aug	21	22	23	72	72	72	72	72	72	13	104	103	95	81	88	77	67	52	77	146	105	82	77	95
10-Aug	79	81	83	48	47	56	62	115	86	99	74	70	93	141	80	132	115	112	126	188	116	136	62	79
11-Aug	82	61	49	66	44	33	40	40	40	58	57	89	98	98	60	88	107	94	106	94	83	64	61	59
12-Aug	30	33	36	46	17	16	34	20	43	26	70	47	45	37	35	40	32	82	35	93	45	50	62	61

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Appendix A.36. (p 3 of 3)

		Counts by Hour																							
Date		0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
13-Aug	53	40	30	39	19	19	10	32	44	20	34	15	51	42	34	39	62	61	92	60	52	35	50	56	
14-Aug	53	37	22	18	17	22	16	18	19	12	25	9	20	19	20	26	18	36	11	27	19	12	23	28	
Percent	4.0	3.8	3.6	3.9	3.3	2.9	3.1	3.2	3.9	3.5	4.0	4.4	4.4	4.8	4.7	5.0	4.6	5.0	4.8	5.3	4.4	4.2	4.4	4.7	

Appendix A.37. Yentna River south bank sonar counts by hour, 1 July through 14 August, 1987.

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
01-Jul	10	4	10	10	8	1	4	0	5	0	1	0	2	5	1	0	1	3	5	3	0	1	5	13
02-Jul	9	16	7	2	3	6	4	6	3	4	3	8	8	4	6	6	10	11	9	12	10	7	10	9
03-Jul	16	20	6	2	2	12	8	11	6	11	10	8	9	10	7	7	5	3	4	12	10	5	11	10
04-Jul	9	14	7	15	5	10	16	10	9	12	13	9	5	14	9	11	5	11	13	13	18	9	14	10
05-Jul	12	9	13	5	4	12	9	7	22	10	17	12	10	14	2	11	13	11	9	5	10	6	3	6
06-Jul	15	13	9	9	6	4	9	16	17	20	7	10	8	22	11	5	3	5	3	7	12	15	13	10
07-Jul	5	9	15	3	6	5	2	2	5	2	7	24	9	15	7	10	9	14	15	19	6	18	6	9
08-Jul	16	13	11	15	12	4	7	5	6	15	11	8	7	4	4	17	7	9	15	18	7	9	10	7
09-Jul	16	2	4	14	8	10	6	3	7	9	6	6	6	11	8	15	13	13	9	16	2	3	13	12
10-Jul	5	16	11	14	20	18	20	11	10	7	10	9	11	11	16	7	3	3	6	15	12	2	4	6
11-Jul	4	5	8	12	2	5	4	5	9	12	9	23	13	20	6	11	22	20	19	16	9	18	16	19
12-Jul	19	8	12	17	19	22	24	5	21	15	8	25	18	22	22	8	22	14	14	42	14	5	18	18
13-Jul	16	11	15	13	14	32	28	18	8	21	11	7	8	19	20	27	10	6	19	12	1	13	9	8
14-Jul	14	12	8	12	11	19	14	16	19	11	9	9	18	9	15	7	9	9	17	12	11	15	10	20
15-Jul	13	10	13	16	10	9	9	13	14	21	11	8	22	19	14	12	18	19	21	26	15	9	14	20
16-Jul	14	17	17	15	16	11	18	25	30	15	0	18	22	18	17	27	55	52	50	56	48	49	35	46
17-Jul	41	29	27	31	38	54	48	42	38	28	36	26	25	69	56	61	50	43	40	53	48	43	51	49
18-Jul	56	99	69	61	78	58	51	78	57	59	75	50	54	49	32	47	57	54	35	43	41	38	40	60
19-Jul	48	57	126	80	56	76	41	37	32	56	36	30	22	52	40	26	55	60	34	26	79	86	119	103
20-Jul	90	85	61	35	61	53	59	28	39	55	64	38	47	34	22	35	40	40	51	98	66	64	48	85
21-Jul	108	91	101	106	90	104	127	84	117	107	141	117	116	149	122	180	116	109	172	189	188	149	118	131
22-Jul	70	95	86	89	70	83	68	95	80	80	49	86	112	89	130	117	108	86	141	151	105	141	157	154

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Appendix A.37. (p 2 of 3)

Date	Counts by Hour																							
	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
23-Jul	142	199	111	205	183	152	172	163	215	157	183	133	191	183	294	254	220	136	233	191	337	540	392	431
24-Jul	409	414	357	393	400	396	413	295	323	357	405	373	317	466	358	454	494	473	487	771	653	659	723	764
25-Jul	1012	1278	1239	1001	813	791	795	496	479	445	318	359	395	345	295	369	388	394	327	303	536	487	688	849
26-Jul	828	829	750	772	652	603	588	459	482	337	568	649	542	341	270	640	592	733	527	467	517	882	846	1087
27-Jul	916	965	848	872	772	739	801	608	501	485	550	538	546	481	416	496	829	754	798	583	647	715	989	865
28-Jul	777	686	753	734	615	677	726	433	409	412	322	425	329	388	223	291	378	393	344	314	377	425	482	482
29-Jul	434	437	373	427	360	381	294	273	291	196	300	185	197	200	109	103	160	163	161	210	162	143	260	279
30-Jul	270	252	235	217	147	239	151	126	121	103	137	86	92	119	259	172	119	155	99	147	232	263	226	295
31-Jul	302	300	282	272	252	394	287	145	140	124	121	135	166	94	142	114	82	130	192	157	131	114	155	157
01-Aug	146	120	168	124	109	76	104	62	98	72	80	65	73	88	107	81	89	90	172	105	83	143	140	162
02-Aug	205	139	203	187	213	128	175	166	225	158	146	200	159	148	174	213	317	278	217	314	187	204	250	259
03-Aug	351	374	293	355	247	299	249	218	193	123	94	185	156	212	194	158	306	291	184	212	156	211	162	242
04-Aug	276	321	230	233	221	203	205	148	241	216	142	278	321	301	247	258	242	154	221	227	267	275	211	213
05-Aug	283	246	240	231	192	229	127	139	175	252	175	214	251	165	242	336	279	191	161	247	166	114	160	136
06-Aug	139	107	94	87	105	68	65	114	106	103	120	143	125	86	122	152	161	179	138	152	142	168	118	113
07-Aug	128	105	112	109	116	52	97	76	47	34	33	133	121	40	83	29	94	28	101	98	39	56	58	61
08-Aug	42	29	32	30	35	24	26	19	20	29	30	92	88	77	83	65	77	74	89	58	52	68	112	110
09-Aug	104	109	107	59	79	78	56	74	74	83	86	143	116	149	189	191	182	209	151	297	320	298	229	179
10-Aug	238	186	208	128	178	127	195	146	262	197	212	207	218	262	235	165	251	203	234	216	193	159	147	191
11-Aug	166	144	139	145	169	160	177	179	197	170	205	238	217	219	184	232	238	218	249	171	167	128	173	158
12-Aug	147	92	120	93	110	134	133	105	155	141	140	129	124	118	136	142	152	148	114	116	105	66	53	55

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Appendix A.37. (p 3 of 3)

		Counts by Hour																							
Date		0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400
13-Aug	60	45	52	32	29	14	15	31	28	55	59	53	46	77	88	68	86	76	83	79	75	54	62	76	
14-Aug	59	24	32	29	12	25	17	18	34	22	66	23	40	38	37	34	63	31	51	61	76	61	61	81	
Percent	5.3	5.3	5.0	4.8	4.3	4.4	4.3	3.3	3.5	3.2	3.3	3.6	3.6	3.5	3.3	3.7	4.2	4.0	4.0	4.2	4.2	4.6	4.9	5.3	

Appendix A.38. Daily adjusted fish wheel catch by species for the north bank of the Yentna River, 3 July through 14 August 1987.

Date	Hours Open ^a	Sockeye		Pink		Chum		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
03-Jul	27.8	0	0	2	2	0	0	0	0	1	1
04-Jul	0	0	0	2	2	0	0	0	0	0	1
05-Jul	46.4	2	2	7	9	0	0	0	0	2	3
06-Jul	31.9	2	4	9	18	1	1	0	0	1	4
07-Jul	20.3	8	12	9	27	0	1	0	0	1	5
08-Jul	17.8	3	15	15	42	0	1	1	1	5	10
09-Jul	25.6	2	17	19	61	0	1	1	2	3	13
10-Jul	26.8	2	19	24	85	0	1	0	2	3	16
11-Jul	23.6	1	20	37	122	0	1	0	2	3	19
12-Jul	24.0	2	22	59	181	0	1	1	3	4	23
13-Jul	25.0	3	25	90	271	0	1	1	4	2	25
14-Jul	23.5	15	40	70	341	0	1	1	5	1	26
15-Jul	17.5	22	62	60	401	0	1	1	6	0	26
16-Jul	27.5	11	73	106	507	0	1	1	7	1	27
17-Jul	26.9	21	94	95	602	0	1	2	9	4	31
18-Jul	24.2	16	110	60	662	4	5	2	11	3	34
19-Jul	22.8	24	134	44	706	3	8	5	16	1	35
20-Jul	22.6	28	162	80	786	3	11	1	17	4	39
21-Jul	26.2	15	177	87	873	0	11	2	19	1	40
22-Jul	23.8	7	184	33	906	0	11	0	19	0	40
23-Jul	25.1	14	198	43	949	0	11	0	19	1	41
24-Jul	19.0	115	313	128	1,077	6	17	3	22	3	44
25-Jul	13.9	167	480	195	1,272	9	26	9	31	0	44
26-Jul	20.5	200	680	247	1,519	25	51	18	49	0	44
27-Jul	10.0	146	826	274	1,793	10	61	19	68	0	44
28-Jul	6.4	105	931	206	1,999	15	76	0	68	4	48
29-Jul	11.8	102	1,033	161	2,160	16	92	6	74	0	48
30-Jul	19.7	66	1,099	123	2,283	18	110	0	74	0	48
31-Jul	28.8	78	1,177	104	2,387	20	130	3	77	0	48
01-Aug	22.5	74	1,251	79	2,466	19	149	10	87	1	49
02-Aug	24.1	53	1,304	69	2,535	13	162	4	91	0	49
03-Aug	24.4	84	1,388	95	2,630	18	180	3	94	0	49
04-Aug	18.3	79	1,467	157	2,787	38	218	13	107	0	49
05-Aug	14.3	74	1,541	164	2,951	37	255	12	119	0	49
06-Aug	20.7	45	1,586	89	3,040	44	299	10	129	0	49
07-Aug	25.5	29	1,615	28	3,068	15	314	1	130	0	49
08-Aug	26.1	7	1,622	13	3,081	1	315	0	130	0	49
09-Aug	19.6	27	1,649	21	3,102	31	346	1	131	0	49
10-Aug	18.1	41	1,690	139	3,241	111	457	17	148	0	49
11-Aug	15.8	50	1,740	179	3,420	134	591	24	172	0	49

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Appendix A.38. (p 2 of 2)

Date	Hours Open ^a	Sockeye		Pink		Chum		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
12-Aug	20.9	49	1,789	154	3,574	240	831	29	201	0	49
13-Aug	23.3	18	1,807	82	3,656	133	964	10	211	0	49
14-Aug ^b	23.4	17	1,824	52	3,708	97	1,061	12	223	0	49

^a Fishwheel catch adjusted for 24 hours: (daily catch * 24 hours)/hours open.

^b Actual catch: 1393 sockeye salmon; 2983 pink salmon; 876 chum salmon; 172 coho salmon; 47 chinook salmon.

Appendix A.39. Daily adjusted fish wheel catch by species for the south bank of the Yentna River, 3 July through 14 August 1987.

Date	Hours Open ^a	Sockeye		Pink		Chum		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
01-Jul	24	0	0	0	0	0	0	0	0	0	0
02-Jul	24	0	0	0	0	0	0	0	0	0	0
03-Jul	21.7	0	0	7	7	0	0	0	0	0	0
04-Jul		0	0	0	7	0	0	0	0	0	0
05-Jul	46.3	2	2	14	21	0	0	0	0	1	1
06-Jul	32.0	1	3	10	31	0	0	0	0	0	1
07-Jul	20.2	1	4	12	43	0	0	1	1	1	2
08-Jul	17.8	0	4	20	63	1	1	0	1	0	2
09-Jul	26.3	3	7	20	83	0	1	1	2	1	3
10-Jul	26.8	4	11	36	119	1	2	1	3	3	6
11-Jul	23.6	3	14	51	170	0	2	0	3	0	6
12-Jul	23.8	4	18	86	256	0	2	1	4	3	9
13-Jul	25.3	4	22	149	405	0	2	3	7	1	10
14-Jul	23.3	11	33	72	477	1	3	0	7	1	11
15-Jul	17.5	14	47	60	537	1	4	0	7	0	11
16-Jul	27.5	19	66	134	671	0	4	2	9	1	12
17-Jul	27.0	18	84	91	762	2	6	4	13	1	13
18-Jul	24.0	32	116	55	817	3	9	0	13	1	14
19-Jul	22.6	33	149	48	865	3	12	4	17	1	15
20-Jul	22.8	38	187	82	947	1	13	4	21	0	15
21-Jul	26.3	41	228	107	1,054	5	18	2	23	1	16
22-Jul	23.7	53	281	116	1,170	3	21	1	24	0	16
23-Jul	10.3	158	439	96	1,266	7	28	2	26	0	16
24-Jul	7.2	323	762	153	1,419	20	48	3	29	0	16
25-Jul	10.6	380	1,142	362	1,781	16	64	11	40	0	16
26-Jul	15.0	312	1,454	355	2,136	18	82	11	51	0	16
27-Jul	9.9	274	1,728	533	2,669	15	97	27	78	0	16
28-Jul	6.6	240	1,968	451	3,120	69	166	22	100	0	16
29-Jul	10.9	211	2,179	302	3,422	46	212	26	126	0	16
30-Jul	6.0	148	2,327	188	3,610	28	240	44	170	0	16
31-Jul	19.7	185	2,512	212	3,822	33	273	16	186	1	17
01-Aug	16.4	116	2,628	75	3,897	29	302	10	196	0	17
02-Aug	13.5	149	2,777	112	4,009	5	307	18	214	0	17
03-Aug	13.3	162	2,939	170	4,179	22	329	29	243	0	17
04-Aug	11.9	155	3,094	200	4,379	38	367	32	275	0	17
05-Aug	14.8	162	3,256	186	4,565	60	427	21	296	0	17
06-Aug	10.5	75	3,331	82	4,647	57	484	5	301	0	17
07-Aug	25.4	27	3,358	22	4,669	9	493	2	303	0	17
08-Aug	26.4	20	3,378	8	4,677	5	498	0	303	0	17
09-Aug	15.0	69	3,447	50	4,727	51	549	10	313	1	18

- Continued -

Appendix A.39. (p 2 of 2)

Date	Hours Open ^a	Sockeye		Pink		Chum		Coho		Chinook	
		Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum	Daily	Cum
10-Aug	17.8	160	3,607	136	4,863	123	672	28	341	1	19
11-Aug	16.7	160	3,767	161	5,024	161	833	43	384	0	19
12-Aug	21.1	100	3,867	143	5,167	226	1,059	39	423	0	19
13-Aug	23.3	43	3,910	63	5,230	158	1,217	26	449	0	19
14-Aug ^b	23.4	25	3,935	37	5,267	117	1,334	25	474	0	19

^a Fishwheel catch adjusted for 24 hours: (daily catch * 24 hours)/hours open.

^b Actual catch: 2216 sockeye salmon; 3333 pink salmon; 966 chum salmon; 293 coho salmon; 20 chinook salmon.

Appendix A.40. Length composition of the major age classes of sockeye salmon in the Yentna River, 1986-87. Length measured from mid-eye to fork of tail.

Year	Age Class	Male			Female			Total			Ratio Male/ Female
		Ave Length (mm)	Stndrd Error	Sample Size	Ave Length (mm)	Stndrd Error	Sample Size	Ave Length (mm)	Stndrd Error	Sample Size	
1986	1.2	455.27	3.13	104	471.62	5.41	52	460.74	2.76	156	2:1
	1987	484.36	3.21	158	477.13	2.43	156	480.16	2.02	314	1:1
1986	1.3	578.81	2.79	172	562.56	1.51	216	569.78	1.50	388	0.8:1
	1987	590.51	1.98	246	565.46	1.67	222	579.82	1.31	468	1.1:1
1986	2.3	587.64	4.87	25	554.77	4.37	44	566.60	3.30	69	0.6:1
	1987	583.07	3.71	62	565.94	3.29	52	576.70	2.51	114	1.2:1

**Appendix A.41. Weight composition of the major age classes of sockeye salmon
in the Yentna River, 1986-87.**

Year	Age Class	Male			Female			Total		
		Ave Weight (Kg)	Stndrd Error	Sample Size	Ave Weight (Kg)	Stndrd Error	Sample Size	Ave Weight (Kg)	Stndrd Error	Sample Size
1986	1.2	1.43	0.04	98	1.56	0.06	47	1.47	0.03	145
	1987	1.47	0.05	66	1.73	0.13	44	1.57	0.06	110
1986	1.3	3.25	0.06	138	2.77	0.03	188	2.98	0.03	326
	1987	2.82	0.14	24	2.80	0.05	58	2.81	0.05	82
1986	2.3	3.36	0.14	19	2.59	0.06	34	2.87	0.06	53
	1987	2.77	0.46	4	2.82	0.07	18	2.81	0.10	22

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